

# Reflections on Innovative Education in College Computer Teaching

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**Abstract:** Computer education is undergoing educational reform, and college computer education needs to be upgraded to a higher level. Colleges should clarify the requirements of the curriculum system and educational objectives, and explore scientific teaching methods suitable for contemporary education. Innovative education, as a new educational method and concept, has attracted the attention of educators. How to implement innovative education in college computer teaching has become a topic that needs to be explored. This article starts from the concept and tasks of innovative education, and based on the current teaching status of computer education, explores the application of innovative education in college computer teaching with the goal of cultivating students' innovative ability, aiming to provide reference for the development of college education.

## 1. Introduction

With the rapid popularization and progress of computer technology, it has attracted people's attention. With the rapid progress of information technology and network technology, computer science has become one of the popular majors in colleges <sup>[1]</sup>. Meanwhile, owing to the progress of computers, computer courses are gradually offered in primary and secondary schools, which improves the starting point of college computer education and brings certain challenges to computer education. The teaching content, education system, and goals need to be adjusted according to the current education situation <sup>[2]</sup>. Innovative education is an educational method and concept proposed based on the needs of contemporary society. Its core lies in breaking through past teaching models and classroom forms, providing students with opportunities for independent learning and practice through diversified educational skills, enhancing their problem-solving ability and creative thinking, and has become a trend and direction of educational development and reform <sup>[3]</sup>. Therefore, this article will reflect on the application of innovative education in college computer teaching.

## 2. Task of Innovative Education in College Computer Teaching

Innovative education is an educational concept derived from creative education, which starts from the laws of creation and cultivates students' creativity. Its goal is to cultivate innovative abilities and creative thinking. Innovation ability is the ability to form innovative spiritual or material products with personal and social value based on one's own cognition and known information. To cultivate students' innovation ability, it is necessary to clarify the composition of innovation ability and find effective teaching methods <sup>[4]</sup>. According to the actual situation of computer teaching, the content of innovative education should include the following points. Firstly, professional information measurement. Professional knowledge and information are the foundation of innovation. Innovative education requires students to absorb new knowledge as much as possible on the basis of mastering computer knowledge, thereby generating new productivity and innovation. It is an important method to achieve technological innovation. Secondly, innovative thinking. Creativity belongs to an advanced ability in a certain way, and innovative thinking is its core content. Therefore, computer innovation education requires teachers to analyze and research innovative thinking. Thirdly, the spirit and consciousness of innovation can also be understood as the desire for innovation, which is a comprehensive understanding and awareness of the innovation process, methods, and activities. The cultivation of innovation consciousness is the main way to

stimulate innovation motivation. Only by forming innovation motivation can we foster innovation spirit and habits <sup>[5]</sup>. Fourthly, innovative skills refer to the ability to transform the spirit of innovation into innovative products through reasonable means. It is the process of using innovative thinking and abilities to obtain innovative results based on mastering information and knowledge <sup>[6]</sup>.

### **3. Current Situation of College Computer Teaching**

The current computer teaching mainly focuses on teaching operational skills, basic computer knowledge, program design, and software knowledge. The teaching methods include case teaching method, demonstration method, etc. The teaching mode is relatively single, and students' learning of computer professional knowledge mainly comes from the teacher's operation demonstration and theoretical explanation, and their reception of knowledge is relatively passive. Moreover, many teachers believe that students' basic knowledge is not solid, and during the demonstration process, they are regular and lack creativity, which limits students' thinking development. Over time, this may lead to a disconnect between students' theoretical learning and practical experience, limiting their understanding and application of knowledge, and affecting teaching efficiency and quality. Modern computer courses not only require students to master basic computer professional knowledge, but also require them to be able to carry out practical operations, achieve innovation, and meet the needs of innovative talents. Therefore, the current concept and mode of simple knowledge transmission should be changed, innovative teaching methods and principles should be explored, and the cultivation of innovative abilities should be added to teaching objectives to enhance the applicability and innovation of teaching <sup>[7]</sup>.

## **4. Strategies for Innovative Education in College Computer Teaching**

### **4.1 Transform Educational Concepts**

The current era has entered the information age, and teachers should realize that computers are an essential subject facing the future and modernization. Education should cultivate students' innovative power, and enhance the sense of responsibility, urgency, and crisis in education. The new situation of education has put forward new requirements for teachers, requiring them not only to teach professional courses well, but also to guide students' thinking, consciously carry out innovative education, explore new teaching models, and help students cultivate innovative abilities, stimulate their innovative interests and desires, and improve their own literacy through different methods and means. Firstly, teachers should break through the previous teaching difficulties, transform their teaching concepts, change their understanding of education, break through the mode of indoctrination and training, and improve their cognition of educational progress. Secondly, the core of innovative education is to transform the century old traditional teaching model, emphasizing creative thinking and student participation. Therefore, teachers should change their roles and no longer play the authority and source of knowledge, but instead act as encouragement, mentor, and guide for students, cultivating practical abilities such as teamwork and self-directed learning, helping students solve practical problems, and improving their innovative thinking. Teachers should recognize that innovative education is a practical and problem-oriented educational method, paying attention to students' critical, creative, and proactive thinking in teaching, and encouraging students to innovate and explore. At the same time, teachers should explore advanced educational resources in teaching, and colleges should increase investment in innovative computer teaching to keep up with the progress of the times. Finally, teachers should improve their information literacy through various methods, absorb advanced computer knowledge, develop rich teaching resources, continuously innovate the curriculum system, and adapt to the development of society.

### **4.2 Innovate Educational Methods**

Computer science has its own teaching laws, and innovative education should combine the teaching characteristics of computer science with the task requirements of innovative education for computer science teaching, and explore scientific teaching methods. Firstly, teachers should focus

on the increase in students' information measurement based on their situation, and cultivate their ability to collect and process information. Innovative education is different from previous education in that it changes problem-solving to cultivating students' questioning ability. After explaining professional knowledge, teachers should also provide a brief introduction to relevant knowledge, and reflect innovation in homework, adding innovative homework, and guiding students to solve problems through their own review and summary. For example, in the data structure course, teachers can introduce the application and algorithms of tree structures in the classroom, and assign research on the limitations of their application in homework, guide students to explore, create a research atmosphere, and enhance their innovation ability. Secondly, teachers can combine the history of computer development and task-driven method to foster students' innovative spirit. There are successful experiences and lessons from failures in the history of computer development, which also contain ideas such as Turing and fables, but they are not reflected in college textbooks. Teachers can appropriately introduce them into the classroom, summarize valuable experiences in the history of computer development, analyze innovative skills, and stimulate students' interest, encourage students to question. Moreover, through a task-driven approach, detailed analysis of teaching objectives can be carried out, reasonable learning sequences can be arranged, task-based learning methods can be constructed, and students can be guided to innovate and quote through tasks. It can also be combined with graduation projects, course designs, etc. to achieve task innovation. Thirdly, extracurricular activities should be expanded, which can be carried out through special projects, competitions, academic reports, and other forms to cultivate students' innovation ability and problem-solving ability.

#### **4.3 Innovate Evaluation and Management**

Computer courses are actually more inclined towards practical courses, which have a certain degree of particularity. It is precisely because of this particularity that higher requirements and obstacles are put forward for teaching and learning. Students should continuously summarize problem-solving methods, improve operational and innovative abilities, open up ideas, explore careers, and tap into their own potential to adapt to the needs of society. However, the existing teaching and management models that have not been successful in innovative education can be directly used. Teachers need to spend more energy and time collecting information, preparing materials and tasks, and innovating. They also need to summarize and coach students' innovative achievements. Therefore, colleges should understand and recognize the work of teachers, apply scientific educational methods and achievements to teaching evaluation and management, and incorporate innovative education into teaching requirements and plans. Firstly, innovative homework can be added to the curriculum system, setting basic requirements for classroom teaching, and calculating the teacher's summary and guidance on innovative homework as their workload. Secondly, innovative archives can be created for teachers and students, and their innovative projects and assignments can be recorded as the content of the innovation archives, and used as an important basis for evaluation, which is included in the evaluation of teachers and students. Finally, curriculum design courses can be added to encourage and guide students to conduct innovative project research after completing one or several related courses. During this process, it is critical to focus on the management of innovative projects, hold regular innovation activities, develop educational bases, strengthen school-enterprise cooperation, and provide more practical opportunities for students to foster their innovative abilities.

#### **5. Conclusion**

In summary, the application of innovative education in college computer education will promote the progress of computer teaching towards the new era, summarize teaching experience in practice, improve the innovation ability of teachers and students, achieve scientific innovative education, and promote the improvement of teaching efficiency and quality in computer science.

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