

# *Research on Computer Network Teaching Reform and Exploration driven by Network Big Data*

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**Abstract:** In recent years, China's Internet technology and information communication technology have developed rapidly, which not only promotes the development and innovation of social science and technology, but also creates a new era of big data. In the context of big data, the teaching of computer network courses has also changed compared with the past. This paper briefly introduces the characteristics of the era of big data and the impact of the era of big data on computer network teaching, and then puts forward the reform strategy of computer network teaching in the era of big data. In order to improve the quality of computer network teaching in China, strengthen students' practical and innovative ability, and cultivate a new generation of innovative talents for the development of science and technology in China.

## **1. Introduction**

Modern social science and technology are constantly developing, and information transmission is fast. People have gradually entered the Internet era and the era of big data. Big data not only means mastering huge data information and professional information processing capabilities, it gradually affects people's lifestyles, working methods and ways of thinking, and also provides a new opportunity for education and teaching reform. Under the influence of the background of big data, the professional curriculum teaching of major universities is also constantly reforming and developing, especially the computer network major. In the era of big data, based on computers and relying on the Internet, in this environment, most people gradually accept the changes and influences brought by the network, and the teaching mode of computer network majors is constantly innovating and adjusting<sup>[1]</sup>.

## **2. Introduction to the era of big data**

The era of big data is an era of information explosion. Massive data has changed the way data is organized and used, forcing companies and companies to change their business models, and is also changing the educational model of colleges and universities. The impact of the era of big data will have a revolutionary impact on the teaching and learning of colleges and universities while it involves all areas of society.

From a business perspective, data analysis and data applications can provide a large number of

accurate data foundations for an organization or company, which can save a lot of manpower and resources, link big data with cloud computing, and form a huge database analysis system. The data and information required by the user are sorted out in a short time, and feedback is provided to the user in time. From the perspective of teaching, big data resources and information technology have brought convenient conditions to teaching, which has a great impact on the efficiency of students' professional classroom teaching. Universities use data technology to comprehensively manage and classify valuable information to strengthen the construction and management of professional courses<sup>[2]</sup>.

### **3. Current status of computer network teaching**

#### **3.1 Outdated Teaching content**

At present, most universities mainly focus on computer network teaching based on their basic principles, systems and protocols. With the rapid development of network technology, some of the knowledge in computer network textbooks is relatively old, without adding new network knowledge, such as IPv6 network, CDN network, SDN network and NDN network, so that students can hardly understand the working mechanism of real network. Therefore, while teaching the basic theory of computer networks, we track the cutting-edge technologies of network development, constantly update the teaching content, and let students understand the new technologies and applications of the network, so as to cultivate students' innovative ability and stimulate the initiative of learning<sup>[2]</sup>.

#### **3.2 Traditional Teaching method**

For traditional computer network teaching, teachers adopt the teaching method of teaching method through multimedia technology. However, teachers rely on electronic courseware, and the teaching content is limited to the teaching materials, which leads to insufficient interaction between teachers and students in the classroom, and students lack learning. Interest and passion. Therefore, how to deal with the relationship between teachers' teaching and students' learning is the key in computer network teaching, giving full play to the teacher's dominance and students' subjectivity.

#### **3.3 Poor infrastructure**

In the era of big data development, our teaching computer equipment or student personal computers have been popularized, but some school networks have a relatively low transmission rate. When transmitting corresponding teaching information through the network, it is unable to receive information stably, resulting in information confusion. , thus directly affecting the development of online teaching. There are also some devices that are too low-level to configure, not only unable to meet the teaching requirements, but also provide a good learning environment for students<sup>[3]</sup>.

#### **3.4 Simple Teaching evaluation and assessment**

In the traditional computer network teaching, the teaching evaluation and assessment methods are relatively simple. Computer network teachers are usually scored by the Teaching Steering Committee experts, department teachers, leaders and students. School teaching supervision and college teaching supervision did not track each teacher every semester, resulting in problems in teaching that were not discovered. This is not conducive to giving full play to the initiative and enthusiasm of students' learning, weakening the interaction between teachers and students, not

stimulating students' desire to learn, and ensuring the effectiveness of classroom teaching. Table 1 compares the assessment methods before and after the computer network teaching reform<sup>[4]</sup>.

Table 1 Computer network teaching evaluation reform

Traditional teaching assessment	Post-reform teaching assessment
Results analysis teaching	Dynamic tracking of teaching process
Leadership and student evaluation of teaching	Leadership, peer teachers and students evaluate teaching

#### 4. Computer network teaching reform and exploration

Network big data brings valuable opportunities to computer network teaching reform, but also faces great challenges. To this end, according to the current problems in computer network teaching, combined with network big data from the following aspects to explain the reform and exploration of computer network teaching.

##### 4.1 Improving the teaching system of computer network theory course

In the era of big data, students like to acquire computer network theory knowledge from other sources, and do not pay attention to classroom learning. Analysis of the reasons, we believe that there are problems in the existing computer network theory course setting, the computer network theory course teaching system is not perfect. In order to better promote the development of computer network courses in the era of big data, schools should choose some advanced teaching concepts and teaching content. Then the professional development prospects and related concept theories are professionally set. This attracts students' interest and promotes students' theoretical knowledge learning, thus laying a good theoretical foundation for the development of computer network courses.

##### 4.2 Breaking traditional teaching methods

Traditional computer network teaching is mainly carried out in a top-down or bottom-up manner. On the computer network teaching method in the context of network big data, combined with the characteristics of network big data and the difficult content of computer network, the top-down and bottom-up teaching methods are combined. At the same time, the network-related big data experiment content was introduced. This method combines the ideas of case teaching, project-driven teaching, and experimental teaching. Case teaching and project-driven teaching focus on helping students understand the basic principles and specific applications, while experimental teaching mainly based on the various levels of the network and the relationship between the levels to develop experimental content and design experimental programs. Classroom teaching is important, but practical teaching is especially important<sup>[5]</sup>.

Computer network is a practical course. It not only allows students to understand and master the basic principles of computer network, architecture, network protocols, etc., but also allows students to understand the cutting-edge technology of computer networks and enhance students' practical ability. Therefore, in practice teaching, join the experimental content of online big data, and increase the proportion of practical teaching in the overall teaching. Carry out experiments such as verification, design and comprehensiveness, and truly achieve the purpose of practical teaching. For example, the design of student network behavior analysis experiments involves the collection of traffic data, the extraction of student network behavior characteristics, and the establishment of network behavior models. This is a typical network big data experiment that combines computer

networking courses with big data technology. To complete this experiment, you need to have a computer network foundation, big data analysis technology, statistical theory, and so on. Through this experiment, students can stimulate their interest in learning and the ability to solve practical problems, thus improving students' ability to innovate. Figure 1 shows the effect of computer network teaching reform.

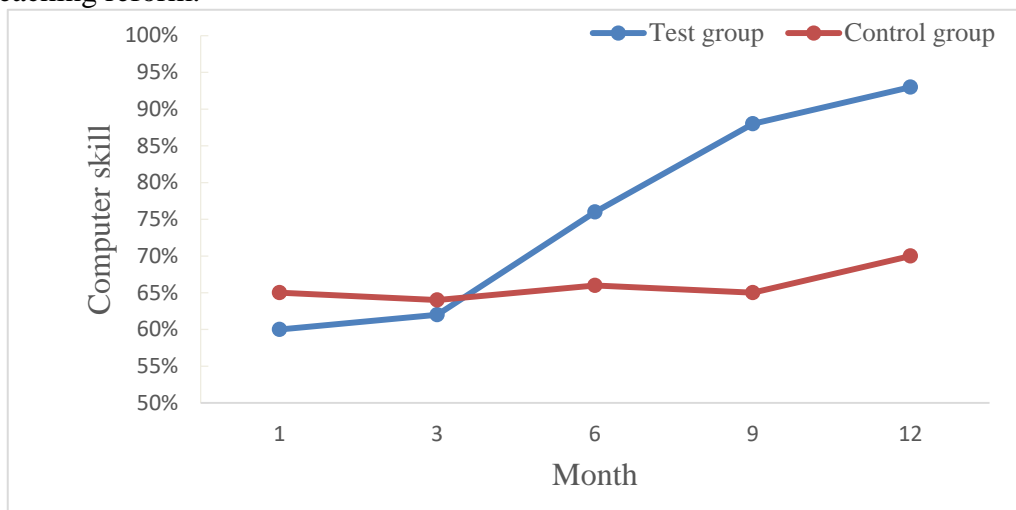


Figure 1 The reform results of computer teaching under the background of network big data

## 5. Conclusions

In the 21st century, science and technology are moving forward, and network technology is advancing. People have gradually entered the information age, and the information age is also the era of big data. In the era of big data, the teaching content, teaching resources and teaching methods contained in computer network teaching have undergone substantial changes in terms of connotation, which brings new challenges to the reform of computer network teaching. We need to use modern methods to improve teaching methods in combination with the characteristics of online big data. At the same time, it is necessary to strengthen the practice link, promote the construction of the practice base, and pay attention to the computer network teaching practice class. In this way, we can better teach and better realize the reform of computer network teaching.

## References

- [1] Liu B, He J. The computer basic education for postgraduates in colleges under Network teaching auxiliary platform reform and exploration[C]// International Conference on Computer Science & Education. 2011.
- [2] Li H, Wang C Z. Notice of Retraction Teaching Reform and Exploration in □Computer Network□ Course Based on Cultivation of Practice Ability[C]// International Workshop on Education Technology & Computer Science. 2010.
- [3] Ran Z. Exploration on the Key Issues of Practical Teaching Reform of Computer Network[J]. Energy Procedia, 2012, 17(Part B):1914-1919.
- [4] Schäfer H, Eisenmann B, Müller W. Higher vocational professional e-commerce exploration of the computer network curriculum teaching reform[J]. Network Security Technology & Application, 2014, 85(17):742-760.
- [5] Peng W. Exploration and research on teaching of basic computer course in higher vocational college[C]// International Conference on Educational & Network Technology. 2010.