



# Research on the Present Situation and Construction of Virtual Teaching and Research Section in Colleges and Universities

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**Abstract.** This paper introduces the present situation and existing problems of virtual teaching and research section in colleges and universities, and puts forward corresponding solutions. This paper probes into the necessity of the construction of virtual teaching and research office in colleges and universities, and holds that the construction of virtual teaching and research office can promote the sharing of teaching and research achievements, the interaction between teachers and students and the improvement of teaching quality, but it needs to overcome the problems in technology and humanities.

**Keywords:** University; Virtual teaching and research section; Construction; Sharing of teaching and research results.

## 1 Introduction

With the rapid development of information technology and network technology, virtual teaching and research section has gradually brought new educational experience and intelligent teaching mode to colleges and universities. Virtual teaching and research room is a kind of virtual environment that imitates or simulates real situations, software, tools and people by means of information technology and network technology, and then realizes interactive learning with the real environment. The factors such as place and time are no longer limited by educators and learners, and the virtual teaching and research room promotes the initiative and creativity of teaching and learning by means of participation, co-creation, collaboration, trial and inquiry.

Virtual teaching and research section is a new grass-roots teaching organization evolved from traditional teaching and research section [1]. Under the background of "four new disciplines" professional reform, it is the inevitable direction of the intelligent transformation of higher education to build a virtual teaching and research room relying on technologies such as virtual reality, big data and artificial intelligence [2]. Therefore, the construction of virtual teaching and research section is an important measure to promote the reform and innovation of higher education and teaching [3]. Using the online and offline virtual teaching and research room to explore the devel-

opment skills of teaching and research activities, through exchanges and visits between colleges and universities, the teaching level of college teachers can be improved and the teaching quality of courses can be improved [4, 5]. In the construction of virtual teaching and research offices in colleges and universities, we need to fully consider the guiding ideology, construction objectives, construction principles and construction contents [6], and at the same time we must follow the principles of problem-oriented, cross-integration, forward-looking research and dynamic construction [7]. However, while the virtual teaching and research section is developing vigorously, it is also necessary to prevent the virtual teaching and research section from becoming a mere formality, formulate management measures according to the characteristics of the teaching and research section, and strengthen the assessment and evaluation mechanism [8]. In the foreign research, there are some noteworthy research results. Ivo Duvall explores the use of virtual research laboratory for interdisciplinary collaborative learning [9]. Anna Sansone proposed the promotion of virtual learning space between different disciplines [10]. This paper will sort out the present situation, existing problems and solutions of virtual teaching and research section in colleges and universities. At the same time, the necessity of the construction of virtual teaching and research section in colleges and universities is discussed.

## 2 Status

In China, the construction of virtual teaching and research room in colleges and universities has been started, but most of them are teachers, and there is still much room for improvement in students' participation and application. The solution to the problem will inevitably require people's thinking and exploration. How to make the virtual teaching and research room more in line with the needs of educational development, how to provide better multi-disciplinary content support such as mathematics, physics, humanities and economics, how to improve teachers' educational guidance skills, how to ensure the integrity of online education, and so on, all need to be studied and investigated in detail from various aspects.

However, there are still many problems in the construction of virtual teaching and research section. The first is the technical problem. Virtual teaching and research room needs to have enough software resources and management ability to effectively serve teachers and students. However, there are some problems in the construction of virtual teaching and research room in some universities, such as lack of professional talents and imperfect technical hardware and equipment. Secondly, there are humanistic issues. The virtual teaching and research office need strong financial support, but it is difficult to achieve the expected results without the understanding and support of the educational administration and school leaders. In addition, students' participation is also a key factor. If students can't fully understand and participate in the virtual teaching and research room, the teaching effect will be difficult to improve.

### **3 Problems Existing**

#### **3.1 Institutional Mechanism Not Perfect**

The construction and promotion of virtual teaching and research section in colleges and universities is not fast enough, the market competitiveness is decreasing, and the system and mechanism are relatively backward. At the same time, the internal development of colleges and universities is relatively independent, the information exchange between units is not smooth, the consensus on the construction of virtual teaching and research rooms is unclear, and the promotion is not effective.

#### **3.2 Use of Educational Resources Inefficient**

The construction of virtual teaching and research room needs a lot of resources, such as equipment, hardware and software environment. However, at present, most schools fail to share information such as teaching resources and teaching materials, and a large number of educational resources are not fully utilized, which may easily lead to repeated courses and monotonous and lengthy learning content.

#### **3.3 Lack of Motivation of Students**

The construction of virtual teaching and research room is based on trust, cooperation and learning, in which students directly participate, build and share resources, so that students' learning center can be transformed into self-discovery motivation and inquiry-thinking subject. However, the current practice mode still lacks specific design for students' needs.

#### **3.4 Insufficient Equipment and Technical Support**

The construction of virtual teaching and research room involves a large number of equipment, infrastructure, hardware settings, software deployment, etc., many of which need to be complicated. If there is no scientific norm and process, it will have an impact on classroom effect and even course quality. At the same time, technical support and service is an essential starting point to ensure the quality of teaching, and it is necessary to ensure professional technical support and timely and rapid response.

#### **3.5 Lack of Innovation in Teaching Mode**

Conventional classroom teaching can no longer meet the diversified learning needs of students, so it is necessary to adopt more innovative, diversified and personalized teaching modes to meet the needs of students' independent learning and inquiry. However, the teaching resources and teaching design of virtual teaching and research rooms in many universities still stay in simple courseware making and demonstration, and lack diversified exploration and application of interactive teaching and course construction modes.

## **4 Solution**

### **4.1 Improve the Promotion Mechanism**

In the process of promoting the construction of virtual teaching and research section in colleges and universities, it is necessary to establish more perfect mechanisms and policies, refine the relevant goals and indicators of the school, and improve the participation and driving force of departments and teachers within the school for the construction of virtual teaching and research section. At the same time, in the promotion process, we need to use excellent third-party platforms to attract more students to actively participate.

### **4.2 Professional Personnel Training**

Schools should strengthen the cultivation of educational informatization talents, encourage and support individuals and groups to carry out relevant research, and carry out in-depth cooperation in research.

### **4.3 Provide Sufficient Technical Equipment**

Schools should increase investment in the technical equipment of the virtual teaching and research room, including the purchase of hardware facilities such as servers and network access, so as to lay an excellent hardware foundation for the construction and management of the virtual teaching and research room.

### **4.4 Improve Student Participation**

Schools should pay attention to expanding the application and promotion of information technology, realize the integration of educational and scientific research platforms with teachers and students, and increase the opportunities for students to participate in it, such as conducting teaching and research competitions and participating in the publication of papers.

### **4.5 Advocate Idea of Virtual Education**

Schools should encourage teachers to actively carry out virtual education teaching experiments and research, recommend virtual education textbooks, and vigorously advocate the basic ideas of virtual education in order to improve teachers' and students' awareness, knowledge level and network literacy.

### **4.6 Teaching Mode Innovation**

In order to meet the diversified learning needs of students, it is necessary to explore and apply more innovative and diversified teaching modes in the virtual teaching and

research room. For example, the teaching elements such as virtual laboratory and virtual simulation should be added to implement the educational concept of "student center" and promote the innovation and diversified development of college education and teaching. Management mode innovation: In order to ensure the security and confidentiality of teaching resources and information in the virtual teaching and research room, it is necessary to adopt a reasonable management mode to ensure the administrator's role and facilitate the handling of problems. At the same time, it is also necessary to adopt an open management mode to encourage teachers and students to participate in the construction, management and maintenance of virtual teaching and research rooms.

## **5 Necessity**

### **5.1 Promote the sharing of teaching and research results**

For a university, teaching and scientific research are inseparable. Teaching and scientific research need to promote and support each other. Virtual teaching and research room can provide a platform for teachers to exchange and share teaching experience and research results, and help teachers improve their teaching level and scientific research ability. This platform can support various forms of data sharing, such as teaching plans, test papers, teaching design and so on. Sharing successful teaching and research results will help more teachers understand the latest teaching experience, methods and skills.

### **5.2 Teacher-student interaction**

Virtual teaching and research room can create closer ties between teachers and students. Students can better understand the content and direction of the course, ask questions to teachers and get timely answers. Teachers can also learn more about students' learning, so as to adjust teaching strategies and improve teaching effect.

### **5.3 Improve the quality of teaching**

Virtual teaching and research room can promote teachers' mastery of courses and the display and utilization of educational resources, thus testing the quality and effect of teaching. Teachers can improve teaching methods and skills through online testing and evaluation, and further improve the quality and efficiency of classroom teaching. Through feedback, online question-and-answer and investigation in the virtual teaching and research room, teachers can collect more information, constantly optimize teaching plans and improve teaching effects.

### **5.4 Promotion of education informatization**

Virtual teaching and research office are one of the long-term strategies and important

measures to implement education informatization. Through the promotion and application of virtual teaching and research room, the dissemination and popularization of education information can be strengthened, and the application level of information technology and infrastructure construction in college education and teaching can be improved.

## 6 Conclusion

With the deepening of information construction in colleges and universities, virtual teaching and research office has become an important carrier and means of education and scientific research in colleges and universities. However, at present, there are still technical and humanistic difficulties in the construction of virtual teaching and research room. How to solve these problems and establish an effective virtual teaching and research office will help improve teachers' educational level and scientific research ability, promote the improvement of the information quality of the whole people, and provide strong support for better development in the future.

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