

Research on the Logical Framework and Promotion Path of Virtual Faculty Construction under Digital Transformation

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ABSTRACT

With the rapid development of information technology, digital transformation has become an inevitable trend in the field of education. As a key link in this transformation, the virtual teaching and research room can not only break through the time and space limitations, but also improve the quality and efficiency of teaching. However, how to scientifically build a virtual teaching and research room in the context of digital transformation is still a problem that deserves in-depth exploration. Based on the theory of educational technology and modern teaching theory, this paper designs the logical framework of virtual teaching and research office and puts forward specific promotion paths. It is found that policy support, technology platform construction, teacher training and student interaction are the cornerstones of successful construction of virtual teaching and research office. By comprehensively analyzing the cases, this paper further explores the challenges and solutions of virtual teaching and research rooms in practical applications, providing valuable references for the digital transformation in the field of education.

KEYWORDS

Digital transformation; virtual faculty; logical framework; advancement path; educational technology

1 Introduction

Digital transformation is profoundly changing the face of education. With the widespread application of the Internet, cloud computing, big data and other technologies, the education model and teaching methods have undergone significant changes. As an important result of digital transformation, the virtual teaching and research room not only provides a convenient communication platform for teachers, but also creates a rich learning environment for students. However, the construction of virtual teaching and research room is not a quick fix, and requires scientific planning and systematic implementation. The purpose of this paper is to explore the logical framework and promotion path of the construction of virtual teaching and research room in the context of digital transformation, and to put forward specific and feasible construction strategies through theoretical research and case study analysis, with a view to providing useful references for the digital transformation in the field of education. Digital transformation is not only a technological innovation, but also an update of educational concepts, which requires the joint efforts of educational institutions and educators at all levels to promote the construction and development of virtual teaching and research offices.

2 Digital Transformation in Education

The application of digital transformation in the field of education is no longer just a renewal of technology, but a fundamental change in the education model and teaching philosophy. Cutting-edge technologies such as the Internet, cloud computing, big data and artificial intelligence not only provide brand new tools for education, but also point out the direction of the future of education. In the context of digital transformation, the sharing of educational resources has become more convenient, and students have access to high-quality educational resources, whether in remote mountain villages or bustling cities. This kind of resource sharing across time and space has greatly enhanced the fairness and universality of education. The construction of technology platforms is an important support for digital transformation. For example, many colleges and universities have established online course platforms through which teachers can easily upload lecture notes, video tutorials and assignments, while students can study anytime, anywhere. This flexible learning method not only facilitates students, but also reduces the workload of teachers ^[1]. Meanwhile, the application of big data technology makes the teaching process more personalized. By analyzing students' learning data, teachers can understand students' learning situation in a timely manner, adjust teaching strategies, and realize tailored teaching. This personalized teaching mode greatly improves students' learning interest and effect. Intelligent tutoring systems, virtual labs and automated assessment tools not only provide personalized learning support, but also simulate the experimental environment, allowing students to practice in the virtual world. This kind of virtual experiment not only saves time and cost, but also avoids safety risks in actual operation. In addition, the construction of virtual teaching and research room is a highlight of digital transformation. The virtual teaching and research room not only provides a platform for teachers to communicate and collaborate, but also creates opportunities for students to interact and participate. Students can engage more deeply in the learning process through online discussions, collaborative projects and virtual experiments to

enhance their learning experience and effectiveness. However, digital transformation also brings some challenges. Rapid changes in technology require educators to continuously learn and adapt to new tools, which requires continuous training and support.

3 Logical Framework of Virtual Faculty Construction

3.1 Theoretical foundation

The construction of virtual teaching and research laboratories cannot be separated from a solid theoretical foundation. Educational technology theory provides technical support and methodological guidance for virtual teaching and research rooms, emphasizing the application and innovation of information technology in education. Modern teaching theory, on the other hand, provides systematic theoretical support for the construction and operation of virtual teaching and research laboratories from the three dimensions of teaching content, teaching methods and teaching evaluation. Contemporary educational technology theories, such as constructivism theory, advocate that learning is an active constructive process, and the virtual teaching and research office can effectively promote students' active participation and self-exploration by providing rich online resources and interactive platforms. At the same time, the blended learning theory of modern teaching theory, which emphasizes the organic combination of online and offline teaching, makes the virtual teaching room not only able to provide a flexible learning environment, but also ensure the depth and breadth of teaching ^[2]. The combination of technology and theory provides strong support for the construction of virtual teaching and research rooms. The application of cloud computing and big data technology enables the virtual teaching and research office to efficiently manage massive educational resources and student data, thus realizing personalized teaching and support. Artificial intelligence technology further enriches the means of teaching, providing tools such as intelligent tutoring and automatic assessment, making the teaching process more efficient and intelligent. The integration of these theories and technologies not only improves teaching effectiveness, but also brings new opportunities and challenges for educators.

3.2 Logical framework design

The design of the logical framework of the virtual teaching and research center is the core of its successful construction. A reasonable logical framework not only ensures the efficient operation of the technology platform, but also promotes good interaction between teachers and students. In the design process, the most important thing is to clarify the goals and functions of the virtual teaching and research room. Goal orientation determines the overall direction of the framework, such as improving teaching quality, promoting teacher collaboration, and enhancing student participation. Functional design, on the other hand, needs to be centered on these goals to ensure that each module can effectively support teaching and learning activities. The technology platform is the cornerstone of the virtual teaching and research center. A stable and powerful technology platform can provide a wealth of online resources and tools, such as video conferencing, online homework submission, and virtual laboratory environment. These tools not only facilitate teachers' teaching, but also greatly improve students' learning experience. At the same time, the design of the platform should focus on user experience. A simple and intuitive interface and friendly operation guide can reduce the barriers to use and make users more willing to participate in it. Data management is another key aspect in the design of the logical framework ^[3]. Virtual teaching rooms need to collect and analyze a large amount of teaching data for personalized teaching and continuous improvement. Data security and privacy protection are issues that should not be ignored, and the design should use advanced encryption technology and strict data management policies to ensure data security and privacy. The precision and timeliness of data analysis can help teachers understand students' learning situation in time and adjust their teaching strategies, so as to improve the teaching effect.

4 Path of Virtual Teaching and Research Office Promotion under Digital Transformation

4.1 Policy Support and System Guarantee

In the context of digital transformation, the promotion of virtual teaching and research offices cannot be separated from policy support and institutional guarantee. National and local education departments should introduce corresponding policies to provide clear guidance and support for the construction of virtual teaching and research laboratories. For example, special funds should be set up for technology research and development and equipment updating, which can not only reduce the economic burden of schools, but also stimulate the enthusiasm of teachers and students. The clarity and continuity of the policy can give educators a clearer direction and confidence in promoting the use of technology in education. School management also has an important role to play in this regard. They need to

establish a whole set of management systems suitable for the development of virtual teaching and research laboratories to ensure the smooth operation of various links. For example, a specialized technical support team should be set up to solve problems encountered by teachers and students in the process of using the system and to enhance the user experience. Institutional protection should also include incentives for teachers, such as incorporating the use of virtual teaching and research laboratories into the assessment system to motivate teachers to take the initiative to participate and innovate. Institutional protection is also reflected in data management. Virtual teaching and research laboratories need to deal with a large amount of teaching data, and there must be strict rules and regulations to ensure data security and privacy. Reasonable use and protection of data not only enhances users' trust in the platform, but also provides a scientific basis for educational decision-making.

4.2 Technology Platform Construction

The technology platform is the core support of the virtual teaching and research center, and its construction quality directly affects the teaching effect and user satisfaction. An efficient and stable technology platform can provide teachers and students with a wealth of online resources and tools, such as high-quality video conferencing systems, convenient online homework submission functions, interactive discussion forums and so on. These tools not only facilitate daily teaching activities, but also provide the possibility of personalized learning and distance education. The user experience design of the platform is particularly important. A simple and intuitive interface and easy-to-use operation process can greatly reduce the threshold of users and enhance the frequency of use. Imagine a platform with complex operation and confusing functions, teachers and students will feel disturbed, which in turn affects their motivation. Therefore, the technical team should fully consider the special needs of education during the development process and work closely with educators to ensure that the platform is both advanced and practical. Security is also a part of technology platform construction that cannot be ignored. As education data involves the privacy of students and teachers, the platform must adopt advanced encryption technology and strict data management policies to ensure the security of information, which is not only required by law, but also a guarantee of trust for teachers and students^[4].

4.3 Teacher Training and Capacity Enhancement

Teachers are not only disseminators of knowledge, but also practitioners of new technologies. In the face of digital transformation, teachers need to master new teaching tools and methods, which cannot be separated from systematic training and support. It is essential to organize regular online and offline training activities to help teachers familiarize themselves with the functions of the Virtual Teaching Room, such as video conferencing, interactive discussion forums, online homework submission, and so on. These trainings will not only improve teachers' technical skills, but also boost their confidence and inspire them to be creative. Teachers' capacity enhancement should also include the updating of teaching concepts. The virtual teaching room breaks the time and space limitations of traditional teaching and provides more flexible and diverse teaching methods. Teachers need to learn how to interact effectively in the virtual environment to stimulate students' interest and participation. For example, using interactive discussion forums for group work and conducting real-time Q&A via video conferencing are methods that can make teaching more lively and interesting. Educators should actively embrace changes and continuously explore and practice new teaching modes to improve teaching quality. It is also very important to establish a teacher exchange platform. On this platform, teachers can share their teaching experiences and difficulties encountered, and learn from and support each other. This open communication atmosphere not only promotes cooperation among teachers, but also accelerates the optimization and innovation of teaching methods. Teacher training and capacity enhancement is an ongoing process that requires the joint efforts of the education sector and schools to provide teachers with abundant resources and continuous support, so that they can continue to grow in the digital transformation and become leaders in education innovation.

4.4 Student Participation and Interaction

Students are the ultimate beneficiaries of the virtual classroom, and their participation and interaction have a direct impact on the effectiveness of teaching and learning. In a traditional classroom, students may be reluctant to speak for a variety of reasons, but in a virtual faculty room, such barriers can be greatly reduced. Utilizing functions such as interactive discussion forums, online voting and real-time Q&A, teachers can better motivate students to speak freely and express their opinions in the virtual space. This kind of interaction not only enriches the classroom content, but also cultivates students' critical thinking and expression skills. At the same time, the virtual teaching room can provide a more personalized learning experience. Each student's learning progress and interests are different, and the platform can push suitable resources and exercises according to students' specific needs, helping them master knowledge more efficiently. This kind of precise learning support can make students feel the temperature and care of teaching and enhance their

learning motivation. To further enhance student engagement, some interesting online activities and competitions can be designed. For example, organizing online group discussions, virtual lab competitions, and project collaborations are activities that not only increase student interaction, but also allow them to learn and grow by doing ^[5]. The ultimate goal of education is to develop students' all-round abilities, and the interactive function of virtual teaching and research laboratories is an important means to achieve this goal.

4.5 Evaluation and Feedback Mechanism

In the context of digital transformation, it has become difficult for traditional assessment methods to fully reflect student learning. The virtual teaching and research office can monitor and analyze students' learning progress, engagement and interaction in real time through big data and artificial intelligence technology. This precise assessment method can help teachers identify students' problems in time and provide personalized tutoring and support. What's more, the assessment results should be transparent and fair, so that both students and parents can clearly understand the learning situation. This transparency not only enhances students' self-knowledge, but also motivates them to learn. Imagine that when students see the results of their progress and efforts at every step, they will feel recognized and encouraged to participate more actively in their learning. Feedback mechanisms are equally indispensable. Feedback from students and teachers is an important basis for improving the virtual faculty. The platform should set up convenient feedback channels, such as online questionnaires, live chats and suggestion boxes, so that students and teachers can put forward their suggestions and opinions anytime and anywhere. Education departments and schools should take every piece of feedback seriously and make timely adjustments and optimizations so as to ensure the continuous improvement and development of virtual teaching and research laboratories. In addition, assessment feedback meetings are organized on a regular basis so that teachers, students and parents can have face-to-face exchanges and jointly discuss problems in teaching and learning as well as improvement plans.

5 Conclusion

Digital transformation provides a broad space and unlimited possibilities for the construction of virtual teaching and research office. Based on the theory of educational technology and modern teaching theory, this paper designs a logical framework for virtual teaching and research office and proposes a specific promotion path. The study shows that policy support, technology platform construction, teacher training and student interaction are the key elements for the successful construction of virtual teaching and research office. These elements are not only independent of each other, but also closely related, and together they form a solid foundation for the construction of virtual teaching and research laboratories. In the future, with the continuous progress of technology and the deepening of educational theories, the construction of virtual teaching and research laboratories will be even better, and is expected to become an important tool for promoting educational equity and improving teaching quality.

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