



Research on the Construction of Digital Teaching Resources in Guangdong Vocational Colleges Under the Background of Double High Plan

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Abstract. This paper is committed to deeply explore the innovation and development of digital education resources in the field of higher vocational education in Guangdong Province. With the strategic promotion of the "Double High" project, higher vocational colleges in Guangdong province are undertaking the responsibility of optimizing the quality of education and improving the teaching experience. This paper studies the current situation of digital education resources in higher vocational colleges in Guangdong Province, reveals the current problems and challenges, and extracts the key factors and implementation strategies. Build a comprehensive construction process covering requirements identification, resource construction, system integration and application. It will make full use of Internet data and professional knowledge to ensure the scientific and practical nature of the research, and contribute wisdom and strength to the construction of digital teaching resources in Guangdong higher vocational colleges.

Keywords: Vocational education, Digital learning resources, Building models.

1 Introduction

"Double High School Plan" is an important policy in the field of higher vocational education in China, which aims to promote the convolutional development and quality improvement of higher vocational education. This not only injects new vitality into higher vocational education, but also puts forward higher requirements for the construction of teaching resources in higher vocational colleges. Especially in the context of the digital era, how to use information technology means to build and construct high-quality digital teaching resources has become an important issue faced by Guangdong higher vocational colleges. As the forefront of China's reform and opening up, Guangdong's higher vocational education development has been at the forefront of the country. However, with the further development of education informatization, Guangdong

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higher vocational colleges still face many challenges in the construction of teaching resources. For example, some schools lack scientific planning and systematic management in the process of resource construction, resulting in serious duplication and waste of resources. Some schools too pursue the advancement of technology, but ignore the practicality and education of teaching resources. Therefore, Guangdong higher vocational colleges in the process of promoting the construction of digital teaching resources, need to continue to explore and improve, in order to achieve the sustainable development of education informatization.

2 Theoretical Basis for the Construction and Application of Digital Teaching Resources in Higher Vocational Colleges

2.1 Construction Theory of Digital Teaching Resources

The construction of digital teaching resources involves many theories, among which educational informatization theory and instructional design theory are the two core. The theory of educational informatization advocates that information technology should be deeply integrated into the field of education to realize the digitization, networking and intelligence of educational resources, so as to improve the quality of education. The theory of educational informatization provides macro guidance and direction for the construction of digital teaching resources, and emphasizes the digital processing, online sharing and interactive application of resources to meet the needs of modern education.

Under the framework of instructional design theory, the construction of digital instructional resources should follow certain instructional design and media design principles. Instructional design theory focuses on how to systematically design instructional processes and resources according to teaching objectives and learner characteristics to achieve the best teaching results.

In the process of constructing digital teaching resources, the theory of educational informatization requires to make full use of modern information technology and transform traditional teaching resources into digital format, which is convenient for network transmission and sharing. For example, paper textbooks can be converted into e-book formats, classroom lectures can be recorded into online videos, and even virtual reality technology can be used to create simulated experimental environments. These digital resources not only enrich the teaching content and form, but also provide students with more flexible and personalized learning options. The theory of instructional design requires students to be the center, and to design and optimize teaching resources according to learning characteristics and needs. For example, for students of different disciplines and majors, different types of digital teaching resources, such as case analysis, simulation experiments, and interactive exercises, need to be provided to meet their respective learning styles and interests.

2.2 Application Scenarios of Digital Teaching Resources in Higher Vocational Colleges

In the teaching practice of higher vocational colleges, the application of digital teaching resources has penetrated into all teaching links, which provides strong support for improving teaching quality and efficiency. With their unique advantages, these resources play an increasingly important role in many scenarios such as practical teaching and online learning.

The characteristics of digital teaching resources in higher vocational colleges are mainly reflected in the interaction, multimedia and updatability. The interactivity enables students to participate in the learning process more actively, get feedback in time through simulation operation, online testing and other ways, so as to adjust their learning strategies. Multimedia enriches the expression of teaching content. The combination of text, pictures, video and other elements makes the abstract and complex knowledge points more intuitive and easy to understand. The updatability ensures the timeliness and foresight of teaching resources, and can constantly update the content with the development of the industry and technological progress, so as to ensure the close connection between teaching and professional needs.

According to relevant statistics, by 2023, the construction of digital teaching resources in higher vocational colleges in Guangdong has achieved remarkable results (Table 1), with the number of online courses reaching thousands, covering various professional fields. These online courses not only provide students with more learning options, but also become an important window for higher vocational colleges to show their teaching strength and serve the society. The application of digital teaching resources in higher vocational colleges in practical teaching, online learning and other scenarios is increasingly extensive and in-depth, which is of great significance for improving the quality of higher vocational education and cultivating high-quality technical and skilled talents^[1].

Table 1. Guangdong Higher vocational colleges to build a list of national digital resources.

Serial number	Project name	Quantity
1	national-level MOOCs	80
2	Through the acceptance of professional teaching resources library	9
3	Typical case of vocational education demonstration virtual simulation training base	3
4	Access to the national wisdom platform course	728

(Data sources: Guangdong province higher vocational education quality annual report (2023))

2.3 Educational Informationization Policies and Standards

With the rapid development of information technology, education informatization has become an important trend of contemporary education development. In the process of promoting educational informationization, the government and relevant institutions have formulated a series of policies and standards, aiming to regulate the development of educational informationization and ensure its quality and effect.

At the national level, China's Ministry of Education has issued a number of educational informatization related policies. For example, the "Education Informatization 2.0 Action Plan" clearly puts forward the development goal of basically achieving "three full, two high and one big" by 2022, that is, the teaching application covers all teachers, the learning application covers all school-age students, the digital campus construction covers all schools, the information application level and the information literacy of teachers and students are generally improved, and the "Internet + education" large platform is built. This policy not only pointed out the development direction for education informatization, but also provided specific implementation paths and safeguard measures.

At the local level, governments at all levels and education departments have also actively responded to national policies and formulated corresponding implementation rules and standard requirements. For example, the Guangdong Provincial Department of Education has issued the 13th Five-Year Plan for the Development of Education Informatization in Guangdong Province, which clarifies the development goals and key tasks of education informatization, and puts forward specific safeguard measures. According to the actual situation, local standards for the construction and application of digital teaching resources have been formulated to ensure the quality and application effect of digital teaching resources.

In addition to policy documents, there are also some industry standards that promote the development of educational informatization. For example, the education informatization Technology Standards Committee of the Ministry of Education has formulated a series of education informatization technology standards, including teaching resource metadata specifications, learning resource management system specifications, etc., which provide technical guidance and support for the construction and construction of digital teaching resources^[2].

3 The Development and Construction Model of Digital Teaching Resources

3.1 Construction of Digital Teaching Resources

The development and construction of digital teaching resources is a system engineering, which involves many aspects of theory and practice. In the environment of higher vocational colleges, we should be committed to building a model that conforms to the development trend of education informatization and can meet the needs of modern teaching. The model should include the concept of instructional design, but also need to be integrated into the essence of project management, to ensure the effective construction and efficient use of resources.

From the perspective of instructional design, the construction of digital instructional resources needs to follow the instructional design model. This model emphasizes student-centered, and determines teaching objectives and teaching contents by analyzing students' learning needs, learning styles and prerequisites. On this basis, appropriate teaching strategies and teaching media are selected to design and implement teaching

activities. In this process, special attention should be paid to the interactivity and adaptability of resources, so as to better stimulate students' interest in learning and promote students' autonomous learning and collaborative learning.

In the project management level, the construction of digital teaching resources needs to use the concept and method of project management. This includes defining project objectives, developing a project plan, performing project execution and control, and finally closing the project. In the process of resource construction, the key of project management is to ensure that each task can be completed on time and according to quality, and at the same time allocate resources reasonably and optimize cost structure. By using project management tools such as Gantt chart and PERT chart, we can effectively monitor the project progress, find and solve problems in time, so as to ensure the efficient promotion of digital teaching resources construction^[3].

Combined with the current development trend of Internet technology, the construction and construction of digital teaching resources should also make full use of cloud computing, big data, artificial intelligence and other advanced technologies. These technologies not only provide a more convenient way for the storage and access of teaching resources, but also realize the real-time analysis and personalized recommendation of teaching data, so as to further improve the teaching effect and learning experience.

3.2 Model Implementation Steps

3.2.1 Requirement Analysis.

User requirement analysis mainly focuses on the actual needs of user groups such as learners and teachers. For example, for higher vocational students, they may prefer to obtain digital teaching resources with practical operation guidance in order to better master vocational skills. Therefore, in the demand analysis stage, it is necessary to deeply understand the learners' learning styles, learning habits and expected improvements through digital teaching resources by means of questionnaires and user interviews.

Teaching needs analysis focuses on how to design digital teaching resources to better serve teaching objectives from the perspective of teaching. This includes, but is not limited to, the selection of teaching content, the application of teaching methods, and the implementation of teaching evaluation. For example, in the practical training course, digital teaching resources should be able to provide a simulated practical operation environment to help students carry out practical operation exercises under safe and controlled conditions, so as to improve students' vocational skill level.

It is also necessary to fully consider the feasibility of technology and the sustainability of resources when conducting requirements analysis. The feasibility analysis of technology is mainly to evaluate whether the user needs and teaching needs can be realized under the current technical conditions, and predict the trend of future technology development to ensure the long-term availability of digital teaching resources. The sustainability of resources involves the renewal and maintenance of resources to ensure that digital teaching resources can be improved with the update of technology and teaching content.

3.2.2 Resource Selection and Development.

In the process of the selection and construction of digital teaching resources, resource evaluation is a crucial link. The purpose of the evaluation is to screen out high-quality resources that are suitable for the teaching needs of higher vocational education, and ensure the effectiveness and applicability of resources. In the process of evaluation, it is necessary to comprehensively consider the content quality of resources, the rationality of instructional design, and the feasibility of technical implementation. For example, for a course on mechanical drawing, it needs to be evaluated whether the selected resource can clearly present the drawing steps, provide enough interactive exercises to help students master the skills, and run smoothly on different teaching platforms.

Resource construction is an in-depth work based on assessment. After determining the type and specific content of the required resources, the construction team needs to use professional knowledge and combine the teaching objectives and the characteristics of students to create and optimize the resources. This includes writing lesson plans, making courseware, designing practical training programs, etc. In the construction process, we should also pay attention to the innovation and fun of resources, so as to enhance students' interest in learning and participation. For example, by introducing virtual reality (VR) technology, an immersive learning environment for students in mechanical drawing can be created, allowing students to learn and practice in simulated actual work scenarios.

In the process of resource optimization, it is necessary to continuously improve and update resources according to the actual application effect and user feedback. This includes fixing possible technical problems, adjusting teaching content to meet new teaching needs, and enhancing the interactivity and interest of resources. The optimization process is a dynamic cycle process, which aims to ensure that the teaching resources always keep pace with The Times and meet the changing needs of higher vocational education.

3.2.3 System Integration and Application.

The primary task of system integration is to build a platform with perfect functions and convenient operation. This usually includes the selection and configuration of hardware equipment, the construction and optimization of software systems, and so on. In terms of hardware equipment, it is necessary to select servers and storage devices with stable performance and strong scalability according to the actual situation of the school and teaching needs, so as to ensure the efficient storage and access of digital teaching resources. In the aspect of software system, we should pay attention to the friendliness of user interface, the simplicity of operation process, and the stability and security of the system. Through technical means such as modular design and microservice architecture, flexible expansion and rapid response of the system can be realized, so as to improve the user experience.

System testing is the key link to ensure the quality of digital teaching resources platform. In the testing process, it is necessary to conduct a comprehensive and detailed inspection of the various functions of the system, including resource uploading and downloading, online editing and preview, interactive communication, data statistics

and analysis, etc. The performance of the system should also be tested, such as concurrent access volume, response time, data throughput, etc., to ensure that the system can still maintain stable operation under high load. Security testing is also a part that can not be ignored, including data transmission encryption, user rights management, prevention of malicious attacks and other aspects, in order to protect user data and information security.

In practical application, the integration and application of digital teaching resources platform need to be closely combined with the teaching practice of higher vocational colleges. For example, according to the teaching characteristics of different disciplines, the corresponding teaching tools and resource templates can be customized and constructed to improve the pertinence and practicality of teaching resources. Through big data analysis technology, in-depth mining and analysis of the data generated in the process of using the platform can provide strong support for teaching improvement and decision-making.

3.3 Model Application Cases

Taking a vocational and technical college in Guangdong as an example, the school has invested a lot of resources in the development of digital teaching resources in recent years. They have built a well-established online learning platform that provides students with a rich variety of online courses and learning resources. By introducing advanced teaching content management system, teachers can easily update the course content and ensure the timeliness and accuracy of teaching resources. The school has also cooperated with a number of enterprises to jointly develop a series of practical training and teaching software, so that students can have access to simulation operations consistent with the actual working environment during the school, which greatly improves students' practical ability and employment competitiveness.

However, we also found some problems in the case study. Some teachers still have some technical obstacles in the application of digital teaching resources, and need to further strengthen teacher training and technical support. Although online learning resources are abundant, the enthusiasm and participation of students in online learning needs to be improved. This may be related to the imperfect interactive and incentive mechanism of online learning platforms.

Vocational colleges should regularly organize teachers to conduct digital teaching skills training to improve their ability to use digital teaching resources. An experience exchange platform among teachers can be established to promote the sharing of excellent teaching experience and resources. In order to increase students' participation in online learning, more interactive learning elements can be introduced, such as online discussion boards, study groups, etc., to enhance students' learning experience and sense of belonging. Online learning rewards can also be set up to motivate students to actively participate in online learning and discussion. By strengthening teacher training and enhancing students' participation, the application effect and education quality of digital teaching resources can be further improved.

4 Problem Analysis and Improvement Strategies of Digital Teaching Resources

In the process of improving the quality of digital teaching resources, it is very important to deeply analyze the existing problems and shortcomings. Through comprehensive evaluation and practical application feedback, it is found that the current digital teaching resources mainly exist problems such as obsolete content, insufficient interactivity and insufficient refinement of teaching design.

Aiming at the problem of old content, this paper puts forward the strategy of updating resources regularly. Because of the continuous progress of subject knowledge, teaching resources must keep pace with The Times. It is recommended to review the core curriculum resources every quarter and update the relevant content dynamically according to the development of the subject. For example, in the teaching resources of computer majors, the latest programming languages and technical frameworks should be introduced in a timely manner to ensure that students learn the cutting-edge knowledge of the industry.

The lack of interactivity is another major factor affecting the quality of digital teaching resources. Modern teaching theory emphasizes the initiative of students, so it is imperative to enhance the interactivity of resources. Through the introduction of online discussion board, simulation experiment operation, intelligent question answering system and other functions, students' participation and interest in learning can be enhanced. For example, in physics experiments, virtual reality technology is used to simulate the experimental environment, so that students can carry out experimental operations in virtual space, which is both safe and efficient.

In the aspect of teaching design, it is found that the teaching design of some resources is too general and lacks pertinence and hierarchy. In order to optimize the teaching design, it is suggested to adopt the concept of stratified teaching, and design different levels of teaching resources and exercises according to different students' foundation and ability. Combined with big data analysis technology, students' learning behavior is analyzed to provide data support for personalized teaching.

In addition to the above strategies, you also need to pay attention to user feedback. User feedback is an important basis for optimizing teaching resources. Through the establishment of an effective user feedback mechanism, timely collection and analysis of teachers' and students' feelings and suggestions, can be targeted to improve the quality of resources and enhance the teaching effect.

By updating content regularly, enhancing interactivity, optimizing teaching design and paying attention to user feedback, we can effectively improve the quality of digital teaching resources and contribute to the teaching reform and education informatization of Guangdong higher vocational colleges^[4].

5 Conclusions

Guangdong higher vocational colleges show a positive situation in the development and construction of digital teaching resources. Most higher vocational colleges have

established a perfect digital teaching resource library, covering a variety of subject areas, which effectively supports the development of daily teaching activities. These resources not only include basic teaching resources such as electronic courseware and network courses, but also involve more interactive teaching resources such as virtual laboratories and online training platforms, which significantly improve the quality of teaching. The application of digital teaching resources has a significant role in improving the teaching effect. Through the comparative analysis of students' scores before and after the use of digital teaching resources, it is found that students' academic performance is generally improved after the use of digital teaching resources. This is mainly due to the digital teaching resources can provide more vivid and intuitive teaching content, stimulate students' interest in learning and improve learning efficiency^[5].

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