



# Research on Digital Curriculum Resources Construction of Modern Agronomic Technology Specialty

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**Abstract.** The vigorous development of the planting industry is inseparable from the support of modern agricultural technology and talents.

With the popularization of modern information technology applications and the continuous deepening of teaching reforms, the teaching mode and teaching methods of secondary vocational schools increasingly rely on modern education technology with information technology, network technology and multimedia technology as the core. The article mainly elaborates the existing problems, construction principles, research content, research results, etc. of the construction of digital curriculum resources for modern agronomic technology majors, in order to improve the quality of talent training, and provide reference and reference for brother colleges and universities.

**Keywords:** Modern agronomic technology · Digitalization · Curriculum resource construction

## 1 Introduction

The “14th Five-Year Plan” of the education industry emphasizes: “Implement the Education Informatization 2.0 Action Plan, and basically achieve the development goals of “Three Alls, Two Highs, One Big” by 2025, that is, digital campus construction covers all schools and teaching applications cover all teachers, Learning applications cover all students, the level of informatization application and the information literacy of teachers and students have generally improved, and a large platform of “Internet+ Education” has been built to promote the transformation from educational resources to educational resources, from enhancing teachers and students’ information technology application capabilities to comprehensively improving their Information literacy changes, from integrated applications to innovative development, and strive to build a new model of talent training under the conditions of “Internet +”, develop a new model of Internet-based education services, and explore a new model of education governance in the information age.”

The modern agronomic technology major mainly trains students to develop in the direction of agronomists, fungus gardeners, vegetable gardeners, crop plant protection

workers, and agricultural product brokers. In the process of reform and opening up, the modern agrotechnical specialty of secondary vocational schools has actively adapted to the needs of reform and economic construction, and has achieved considerable development. It has trained a large number of professional and technical personnel for the planting industry in my country, especially in rural areas. In Guangdong, modern agronomic technology has played a pivotal role in cultivating planting technical talents, especially with the improvement of people's living standards, people's demand for horticultural products continues to increase, and the planting industry is developing rapidly. However, with the continuous advancement of agricultural science and technology and the continuous adjustment of the industrial layout, the current secondary vocational modern agronomy professional teaching has been lagging, especially the lagging of talent training in emerging industries, and the instability of rural scientific and technological teams have severely restricted the entire planting industry. development of. Therefore, the training of modern agronomic technology professionals needs reform, and it is particularly important to innovate training models and training methods.

With the popularization of computers and networks, digitization of information has become a major trend in economic and social development in the world today, and an important indicator of the comprehensive strength, core competitiveness and modernization degree of countries and regions. The profound changes that digital technology has brought to education have brought about a qualitative leap in educational thoughts, concepts, models, methods, and methods. The construction of digital campus in higher vocational colleges is an inevitable choice for the implementation of informatization in our country's education reform, and it plays an important role in promoting teaching reform and informatization in higher vocational colleges [1].

Digital curriculum resources are the core of the construction of digital teaching environment. It is based on digitalization, with subjects and majors as the main line, and courses as the center. It integrates teaching plans, curriculum settings, syllabus and other teaching documents and teachers' handouts, courseware, and reference materials., Multimedia resources and other types of teaching resources, and integrate the integrated resources into the teaching process organically, providing teachers and students with a full range of practical teaching information and teaching reference resource services.

Make full use of modern informatization methods, transform teaching methods, integrate them with modern information technology, improve the current deficiencies in modern agronomic technology training and teaching, realize the optimization and sharing of educational resources, realize technological changes in education, and transform learning methods The purpose of improving teaching quality has become an urgent task. Modern agronomic technology is a major with strong practicality. Due to factors such as limited equipment, it has brought many difficulties to the teaching of this major in schools. Only by using information technology and teaching resources, can we keep up with technological updates without a large increase in the investment of hardware equipment, ensure the training of students' learning skills and operation, and ensure the quality of teaching [2].

## **2 Principles for the Construction of Digital Curriculum Resources for Modern Agronomic Technology Majors**

### **2.1 Scientific Principle**

The construction of the digital curriculum teaching resource database must conform to the learning rules of secondary vocational students and the rules of secondary vocational education, and achieve the purpose of “be able to learn” and “assisted learning”. The professional curriculum teaching resource library not only has the top-level design of talent training at the macro level, but also has the curriculum development and resource construction at the micro level [3]. In the construction, the teaching is implemented according to the content, environment and process of the production activities of the enterprise, so that the professional teaching mode is connected with the actual production of the enterprise. There should be teaching resources, curriculum standards, corporate job standards, corporate project cases, and the latest industry information in the resource database to meet the needs of talent training, curriculum learning, and corporate positions.

### **2.2 Practicality Principle**

Digital curriculum resources of modern agronomy technology, integrating four courses of flower cultivation, vegetable cultivation, edible fungus cultivation, and plant disease and insect pest control, and realize the organic integration of information technology and course teaching goals, so that teachers and students can achieve the course in the course of doing, teaching and learning. Harmony and unity can effectively improve the quality of teaching by applying modern educational methods [4].

### **2.3 Standardization Principle**

The construction of the digital teaching resource management platform, such as organizational arrangements, framework structure, etc., needs to be unified with relevant standards, conform to the habits of online learning, and facilitate students to achieve personalized learning. All types of digital teaching resources, from texts to various materials, must be standardized to facilitate upload, download, use and update. The organizational structure should be rigorous, reasonable, and orderly to facilitate accurate and convenient data extraction and safe and controllable platform management. In addition, an intelligent feedback evaluation mechanism should be set up to meet interactivity requirements [5].

### **2.4 Openness Principle**

At present, many digital curriculum resource developers are mainly enterprise software designers, with few teachers, students and other personnel participating, making the resource development software lack of practicality, effectiveness, and system. Therefore, developers are required to develop curriculum resources. Pay attention to content diversity, interactivity, scalability, etc. One is the participation of multiple parties in

the development. The teaching resource library is jointly constructed by the government, schools, industry enterprises, and development units. The school teaching team is the main body of the curriculum resource library. The construction of digital resources should start from the perspective of the demand for talents in corporate jobs and introduce standardized professional qualifications and job skills standards to provide skills guarantee for the training of professional talents. The second is the common use of resources. The professional teaching resource bank is a platform for schools, industries, and the government to cooperate in educating people and social services. The construction results must be opened to the outside world in a certain way, and the teaching and learning functions of the resource bank must be fully utilized. The effect of “feeding back”.

## 2.5 Sustainability Principle

Digital curriculum resources allow teachers and students to study any curriculum in a way that suits them at any time and any place. Teachers and students can add new resources and new information to the resource library anytime and anywhere, and open it to the whole society, and can form a lifelong education system, so that the construction of digital curriculum resources can continue to develop.<sup>22</sup>

# 3 The Construction of Digital Course Teaching Resource Database

## 3.1 Build a Digital Course Learning System

Build a digital course learning support platform for modern agronomic technology integration training room; build a digital courseware resource management system for modern agronomic technology integration training room. At the same time, through the integrated training room high-definition teaching video recording and broadcasting system, it can collect a variety of scene teaching videos, and automatically store the videos in the resource storage system, and integrate with the learning support platform.

The types of teaching resources for digital courses include text, graphics, audio, video, animation, virtual simulation and other materials. The development of digital curriculum teaching resources is mainly based on video and animation. This article mainly introduces the design ideas and development points of curriculum resources.

Practice training is an important part of vocational education teaching activities. The teaching design of digital training courses needs to be integrated into the company's job skill standards, and combined with the common characteristics of teaching practice demonstrations and job skill operations. Text scripts should not be copied directly from the textbooks, and the content of the textbooks should be creatively reconstructed in accordance with professional standards, so as to be as simple and understandable as possible. There are four key steps in the instructional design process of digital training courses:

The first step: clarify the theme and import the content. There are many ways to introduce the teaching design of digital courses of practical training type, such as situation introduction, old knowledge introduction, problem introduction and so on. Different

import methods have their own characteristics, but they must be concise and clear, and the import time should not be too long.

The second step: clarify the principle and clarify the requirements. Secondary vocational students have a weak foundation, so they should simply point out the principles before practical training and demonstration. If complex content is involved and cannot be reviewed quickly, the teacher can provide guidance. In addition, it is necessary to clearly explain the requirements of the training, such as the use requirements of materials, equipment operation requirements, and industry vocational skills requirements, so that the teaching process can be seamlessly connected with the production process of the enterprise.

Step 3: Show the production (principle) process. Demonstrating the training operation process is the top priority of the entire digital course, accounting for 60%–70% of the entire duration, and usually includes the training process, operation steps, and training phenomena. The presentation of this link should highlight the principles of clarity and smoothness, student-oriented, simplified complexity, key points, combination of virtual and reality, appropriate scaling, and ease of communication. Try to remove all redundant information that affects effective communication and reduce the cognitive load of learners.

The fourth step: Summarize and expand. The end of the digital course should be a refinement of the entire process, not “top-heavy”. If it is imported as a question, the answer to the imported question is clearly given, and the answer is echoed from the beginning to the end. At the end of the digital course, the content should be summarized and expanded in order to enhance the learning effect and form a knowledge system structure [6].

### 3.2 On the Learning System

Four courses have been uploaded: “Floriculture, Vegetable Cultivation, Edible Fungus Cultivation, Plant Disease and Pest Control, etc.”. Among them, specific teaching resources include course introductions, course standards, electronic teaching plans, teaching PPT, related videos, related teaching courseware, exercises and test question banks (including homework/test papers), digital teaching materials, etc. The development of digital courses in vocational education should first extract typical work tasks according to the needs of vocational positions, list the exercise steps of the experiment, require a clear demonstration process, grasp the demonstration time, and use short videos to solve a certain knowledge point or a certain point as efficiently as possible. Teaching link. The presentation of knowledge points or teaching links is modularized, which helps relieve the fatigue of students’ attention and strengthen the construction of professional knowledge. The development of digital courses is based on close-ups, clearly highlighting the process of skill action (craft), enhancing the continuity of the picture, and removing irrelevant information. The subtitles of digital courses are presented in the form of “full subtitles+ keyword groups”, in which the keyword groups are presented in different colors or fonts, which can attract the physical sensory attention of students, and can also emphasize the key points and key content of the picture to arouse students’ psychology Attention to the above, ultimately achieve the optimization of the micro-course design and development and the maximization of learning efficiency. The

fine and important skill actions are displayed in the form of animation, which promotes students to better understand the principle of skill and the action process. If individual action screens display various information, they will be presented in the form of “virtual reality”, which is convenient for showing the actual operation or realization principle and enhancing the presentation of content [7].

### **3.3 On the Basis of the Original School-Level High-Quality Courses**

Continue to improve and revitalize the digital teaching resources of flower cultivation, vegetable cultivation, edible fungus cultivation, and plant disease and insect pest control. The built teaching resources include course introduction, course standards, electronic teaching plans, teaching PPT, and related videos., Relevant teaching courseware, exercises and test question bank (including homework/test papers), digital teaching materials, etc., and archive these resources and update them continuously.

The construction of the digital curriculum teaching resource management platform must start with the top-level design of talent training. First, industry research, analysis of job positions, extraction of typical tasks, and clarification of the needs of the enterprise; and then clarify the platform’s requirements according to the requirements of professional curriculum teaching and the needs of students. The functional framework can not only meet the learning of professional core competence, but also take into account the knowledge expansion and ability improvement. The digital course learning platform mainly includes interactive teaching module, courseware resource management module, online resource playing module, course exchange discussion module, Q&A module, assignment/submission/check module, test question bank, etc. In addition, the curriculum resources have added resources such as the corporate technical personnel curriculum library, the corporate management file library, and the professional standard library.

In vocational education, the curriculum is composed of each project, and the project is the basic component and carrier of the construction of fragmented teaching resources. The teaching resource management platform stores teaching resources in fragments, and teachers can combine and reconstruct the fragmented resources according to the learning needs of students. The construction of the vocational education teaching resource database should strengthen the connection between the curriculum content and the regional industry vocational standards, and break the original linear curriculum system. On the digital course learning platform, teachers create courses, create assignments, and create test questions by adding digital teaching resources. Students choose the courses they need to learn through this platform, watch videos and animations, read text resources, participate in online course discussions and teaching evaluations, complete homework online, and participate in exams.

### **3.4 Solve the Problem of Sharing High-Quality Teaching Resources**

The function of the teaching resource library is to promote the “learning” of students and the “teaching” of teachers. The content of the resource library not only contains the teaching elements of the courses, but also has the elements of industry enterprises. The professional teaching team is the main body of the resource library construction. The

main task is to provide necessary professional teaching materials, write digital course scripts, and integrate various teaching resources. To give full play to the importance of school-enterprise cooperation, the construction of the resource database needs to integrate the company's job requirements standards and technical (technical) standards. The development unit is responsible for video shooting and editing, platform construction and debugging, and teaching resource integration. In addition, students are not only users of the resource library, but also participants in construction. In the process of use, they can feed back their opinions on the use of the resource library, upload excellent works, share resources, and further promote the construction of resource banks. By establishing a unified learning support platform and resource management platform, and realizing the seamless connection between the resource management platform and the learning support platform, it is conducive to help teachers sort out resources and teaching ideas, and is conducive to the management, preservation and sharing of excellent resources in the school.

## **4 Research Results**

### **4.1 The Establishment of a Modern Agronomic Technology Information Teaching Resource Database Has Realized Efficient Teaching**

This information-based teaching resource library uses text, pictures, 3D, animation, video and other file formats to refine, simplify, and digitize complex skills teaching content with the help of computer technology, which has high promotion and application value. At present, there are 4 courses of flower cultivation, vegetable cultivation, edible fungus cultivation, and plant disease and insect pest control. There are a total of 120 PPT presentations, 300 pictures, 78 videos, teaching standards, teaching plans, teaching design, 12 sets of question banks, There are 200 classroom tests and 30 cases. The construction of the above resources enables teachers and students to teach anytime and anywhere, especially under the current normal situation of the new crown epidemic, the construction of a teaching resource database breaks the time and space constraints and realizes efficient teaching.

### **4.2 Through the Construction of a Learning Support Platform, the Network Learning Space Is Connected to Everyone**

The network-based access and the use of the learning management platform provide students in the classroom with an environment where they can learn, inquire, submit questions and homework at any time. This makes learning change from a teacher-led and one-way teaching model to student discovery and active learning. It has also changed the traditional teaching that "you can only ask the teacher if you don't understand, and you can only watch it once for demonstration"; cultivate students to learn independently Habits also reduce the intensity of teachers' work.

By opening the online classroom regularly during the self-study period, allowing students to log on to the learning platform, watch videos and courseware, and conduct pre-class and post-class review as required, changing the traditional teaching situation

where students can only learn from boring textbooks and text when they leave the workshop, Improve the effect of self-study classes, and promote the actual effect of project-based teaching with students as the main body.

#### **4.3 Build a Resource Management Platform to Achieve High-Quality Resource Class-to-Class Communication**

Create a modern model of teaching and learning, improve the reuse rate of teaching resources, set up a high-definition video recording and broadcasting system, and collect videos of teaching, observation, and learning in multiple streams.

At present, each teaching teacher has its own teaching resources, but these resources are in the hands of the teachers. The school does not have a unified resource management platform. Many good teaching cases and teaching resources cannot be promoted. The teaching resources are scattered and each teacher teaches. There is no unified management of resources and their own governance. By establishing a unified learning support platform and resource management platform, and realizing the seamless connection between the resource management platform and the learning support platform, it is conducive to help teachers sort out resources and teaching ideas, and is conducive to the management, preservation and sharing of excellent resources in the school.

#### **4.4 Develop a Digital Course Learning Platform to Facilitate the Cultivation of New-Type Professional Farmers**

The open learning platform provides new professional farmers with independent learning conditions, meets the learning needs of different places and different levels, makes teaching resources continue to extend, flexible and convenient, and achieves a win-win situation for economic and social benefits.

## **5 Conclusion**

The construction of digital teaching resources for modern agronomic technology adopts the cooperation method of enterprises and schools, and sorts out the key and difficult points of teaching according to the teaching standards of the courses. This research establishes a teaching resource library for core courses of modern agronomic technology such as edible fungus cultivation, flower cultivation, vegetable cultivation, and plant disease and insect pest control. The results are mainly presented in the form of teaching case videos, PPT courseware and electronic teaching plans of Word documents. Through the network, it can be applied on a computer or mobile terminal. Continuously update and improve the professional resource library of modern agronomic technology, so that it can be displayed in the training room of the professional “integration of science and practice”. This digital teaching resource construction project fills the gap in this field in Guangdong Province, lays a foundation for the professional adaptation to the development of social informatization, and also provides basic digital resources for modern agronomic technology professional teaching in vocational colleges in Guangdong Province and even the whole country.

To sum up, this article studies the problem of sharing high-quality teaching resources, solving the problems of re-learning and resource sharing of students inside and outside the school, and solving the problem of distance learning in training new-type professional farmers. Vigorously promote professional construction and teaching reform, promote the pace of informatization construction in the whole school, and realize the sharing of applications and resources from inside to outside the school through inter-school promotion, and promote the construction and application of informatization in brother schools. Realize resource sharing with enterprises and brother schools, so that relevant practitioners can share relevant resources from the Internet, which has greatly promoted the development of the planting industry in Guangdong and even the whole country.

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