Research on the Construction of Three-Dimensional Curriculum Resources

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Abstract. The continuous development of education technology in the "Internet +" era and the continuous enrichment of network digital resources provide a good environment for the construction of course resources. The three-dimensional development and construction of course resources include teaching documents, teaching contents, teaching mode and other course elements. Based on the development status of education, network and information technology under the background of "Internet +", this paper analyzes the characteristics of three-dimensional curriculum resources, and puts forward the design principles, structural system and application strategies of three-dimensional curriculum resources, which is significance to promote the construction of three-dimensional curriculum resources.

Introduction

Curriculum construction is the core of school discipline construction. The construction of curriculum resources is an important means to promote education and teaching reform and achieve the goal of talent cultivation. In the context of "Internet +", the Internet technology ecosystem composed of new generation information technologies such as big data, cloud computing, Internet of things, block chain and artificial intelligence is deeply integrating with the fields of education and finance and economics at an unprecedented speed. The Internet is no longer an instrumental role supporting education, but a transformative role transforming curriculum construction. Therefore, in combination with the development of information technology and the production and application of curriculum resources, it is an effective way to improve the quality of teaching and talent training in colleges and universities to build a three-dimensional curriculum resource system with various forms, prominent characteristics and suitable for learning, and promote the reform and innovation of talent training mode and teaching mode.

Characteristics of Three-Dimensional Course Resources

Three-dimensional curriculum refers to the combination of digital learning resources and virtual network space with traditional curriculum resources and teaching activities based on the information-based education environment. Teachers and students use school, classroom, network, communication, life practice and other activities to combine knowledge learning, experience construction and social experience as one of the curriculum and teaching process. Three-dimensional course is an important trend, education informatization development change is the result of the development of information technology and curriculum elements integration depth, it is not only the media resources, time and space environment and the technical development, in the form of organization activities such as curriculum and curriculum goal, content, methods, evaluation and so on also will change accordingly.

Three-dimensional curriculum resources refers to the modern education theory as the instruction, to the ability training as the goal, the information technology and the paper textbooks, physical teaching training device, network platform, mobile Internet terminals, such as medium depth fusion,
set more form, more media, a variety of purposes and multi-level for the integration of teaching and
learning resources collection, with distinctive characteristics.

**Diversity of Resource Forms**

Morphological diversity is the main characteristic of three-dimensional curriculum resources. Under
the background of the Internet, three-dimensional course resources deeply integrate
two-dimensional code, APP, VR and other information technologies, network technologies and
equipment with teaching contents, and express the internal structure, operating principles, abstract
concepts and other contents that cannot be expressed by traditional course resources in various
forms. From the perspective of media forms, three-dimensional course resources include traditional
paper textbooks and exercise books, electronic textbooks and test questions, electronic teaching
plans and courseware, animation library, video library, experimental training equipment, VR
training platform, network teaching platform and streaming media library, etc. From the perspective
of the use of curriculum resources, three-dimensional curriculum resources can be divided into
holistic curriculum resources and generative curriculum resources, the integrity of curriculum
resources is provided in the design of curriculum integration, promote learning and classroom
teaching management, and relatively stable kind of resource collection, procedural curriculum
resources refers to the teachers on the teaching schedule and students learning situation, the
real-time dynamic complement and update this part of the resources.

**Systematic Content of Resources**

The construction of three-dimensional curriculum resources should start from the overall design of
the curriculum, and from the professional level, the curriculum resources should meet the
requirements of cultivating students' professional ability, method ability and social ability. From the
perspective of curriculum, it should serve the implementation of specific teaching projects, as well
as personnel training and skill identification of elevator enterprises. Therefore, we must start with
the top-level design of curriculum resources from the goal of professional talent cultivation, and
carry out systematic content planning and design from the aspects of teaching documents, teaching
management, teaching implementation, post practice and so on.

**Dynamic Resource Update**

Under the background of "Internet +", course resources, as the carrier of knowledge, are more open
and more prompt to revise teaching theories, add teaching cases and update teaching contents. On
the one hand, teachers will organize and update course resources according to the teaching situation
and push them to students with different learning progress. On the other hand, the content of the
three-dimensional curriculum resources should be updated and supplemented in time according to
the new theories and technologies of the discipline. These two aspects determine that the
three-dimensional course resources must be dynamically adjusted and updated in real time.

**Construction of Three-Dimensional Course Resource System**

Education information resources construction under the background of three-dimensional course,
involving all the link of the process of curriculum and elements, including how to integrate
information technology into subject teaching, how to make use of technical support to change the
way of teaching and learning, how to use technology to design, development, management and
application of various teaching resources and learning process, etc. Therefore, the selection and
design of curriculum resources should not only correctly grasp the media attributes and
characteristics of various resources, but also conform to the inherent laws of education.

**Design Principles of Three-Dimensional Course Resources**

**Principles of Teaching Core Theory.** The construction of curriculum resources should serve the
teaching of professional courses, not only meet the requirements of talent training objectives, but
also conform to the teaching contents of various courses, and at the same time adapt to the cognitive rules, learning ability and characteristics of learning objects.

**Media Applicability Principle.** The media design of course resources should consider the media properties, learners' learning characteristics, learning objective control and economic cost, and design the media forms of course resources.

**Principles of Content Informatization.** Information technology has changed the study object of study habits and ways of thinking, fully using the modern information technology, the principle of the abstract visualization, knowledge visualization, complex structure material fragmentation, hierarchical learning content, learning experience, can stimulate the learning interest of the learning object, meet the needs of its extensive in learning.

**Structure System Construction of Three-Dimensional Course Resources**

In the information age, with the continuous development of Internet technology, the explosive growth of digital resources and the extensive use of mobile Internet terminal equipment make education and teaching face new environment and challenges. Constructing high-quality and practical course resources is an important guarantee to improve the educational level, guarantee the teaching quality and realize the goal of talent cultivation. Using educational information technology to promote teaching reform and curriculum construction is a necessary means for colleges and universities to improve teaching efficiency and talent cultivation quality. Therefore, the construction of the structure system of three-dimensional curriculum resources needs to fully consider the teaching needs, teaching contents, teaching methods and practical teaching and other links of curriculum construction.

**Course Teaching Demand Analysis.** Three-dimensional course resources system construction needs to consider all elements of the whole teaching process, from teaching goal, teaching content, students characteristics, teaching methods, teaching conditions, such as factor analysis of the demand, according to the course location select resources to build the organization strategy, transfer strategy, management strategy, structure design of the curriculum resources of three-dimensional effect.

**The Elements of Three-Dimensional Curriculum Resources.** Teaching files, mainly for the syllabus, course standard and teaching plan. Teaching document is the top-level design document of curriculum construction, and also the basis of three-dimensional curriculum resources construction. The design of teaching documents needs to be constantly updated according to the current development of disciplines and majors and the needs of talent cultivation, and the content of teaching should be updated in time to optimize the connotation of courses, so as to drive the construction of course resources.

Text materials, mainly for paper textbooks, exercise books, instructions, etc. Text textbooks are mainly based on basic concepts and principles, which are the static teaching content carrier of the classical theory and basic knowledge.

Digital media resources, mainly for the electronic materials, electronic courseware, multimedia teaching software and network teaching resources. The combination of pictures and texts in electronic document and illustration teaching meets the requirements of photography course. The presentation of slides, open good. In addition, a material library is specially designed to provide original documents of literature, graphics, animation and other types of material. MOOC and other online teaching resources also provide students with rich curriculum resources for independent learning.

Virtual simulation resources—mainly including multimedia simulation, VR, simulation database, etc. Such resources are the product of the development of information technology, so they can best reflect the degree of information construction of curriculum resources.

Network information technology, mainly for the recognition technology, platform technology and storage technology. In the construction of three-dimensional course resources, the identification technology is generally the two-dimensional code technology, which expands the resources of
teaching content through the Internet and two-dimensional code technology. Platform technology mainly solves the problem of the application of three-dimensional teaching materials on learners' terminal devices, and is the carrier of other technologies, designs and contents, such as smart campus and APP. Under the background of "Internet +", the development and application of cloud technology break the limitation of original storage technology and enrich the teaching resources needed for three-dimensional teaching materials.

Hardware technology, mainly for carrying more than terminal equipment or carrier of the curriculum resources such as virtual simulation training conditions, such as VR display equipment, hologram, simulation training rooms, etc., to complete the three-dimensional display of curriculum resources.

**Three-Dimensional Course Resource Structure.** Three-dimensional curriculum resources to create is a audio-visual integration, graphic, interactive, audio and video linkage, teaching for the integration of multiple learning system, the teaching files, text, teaching materials, digital media resources, virtual simulation resources and network information technology, hardware and other parts, each part is composed of different types of resources, and is composed of different modules, each kind of resources is shown in figure 1. Each module designs fragmented course resources according to the teaching objectives and contents. All kinds of fragmented resources form an organism through learning task list, providing an efficient resource allocation scheme for teaching and learning. The three-dimensional course resources are not a simple combination of various parts, but after fully studying the attributes, media functions and advantages and disadvantages of each element, the information technology and means are used to learn from each other and complement each other according to the unified guiding ideology and design concept, and finally form a mutual integration system.

![Figure 1. Structure framework of three-dimensional curriculum resources.](image)

**Media Selection and Technology Application of Three-Dimensional Curriculum Resources.** The selection of media and the application of technical means of three-dimensional course resources should be considered from the influence and restriction of teaching content, teaching objects, teaching conditions and other factors. In the curriculum resources of media choice, should from the media function, properties, characteristics, etc, to match with the need of the teaching content of show to consider teaching object characteristics such as perception, abstract ability, at the same time, to fully consider the technology conditions, economic conditions, teaching level and teaching environment.
Application Strategy of Three-Dimensional Course Resources

The application of three-dimensional course resources should be combined with the course resource system and the goal of talent cultivation to carry out teaching mode innovation, and to build and apply a complete three-dimensional course resource system to improve teaching quality and efficiency.

Build a Continuous and Unified Course Resource Development and Teaching Process

The three-dimensional curriculum resources need to complete the content modernization and carrier diversification. The modernization of course content is not to directly incorporate the achievements of modern science and technology into the teaching materials, but to adjust and update the concepts and laws in the teaching materials with the development of science and technology, so as to prepare students for the information life. Diversification of resource carriers refers to the provision of informationized learning environment and activities. On the basis of the original texts and textbooks, various media means such as cd-rom textbooks, online textbooks, online courses, electronic magazines and online test question Banks are adopted to carry and disseminate course information. The application of three-dimensional course resources should attach importance to innovation and application of various information-based teaching modes and methods, organically combine the forms of students' independent learning, group cooperative learning, and teacher-student collaborative communication, and establish a multi-dimensional, multi-standard, respect for students' individuality teaching process. [4]

Supporting Innovative Teaching Models and Learning Concepts

In three-dimensional system of curriculum resources and fully functional network teaching platform, mobile learning platform under the support of teachers can be to "flip" classroom teaching style design, namely arrange students in extracurricular time in accordance with the schedule and requirements prescribed by the teacher learning online course resources, in the classroom, on the other hand, organizes the student to decorate learning tasks interactive discussion and coaching answering questions, or the practice of some corresponding task. Meanwhile, the ubiquitous learning concept and mixed teaching mode are integrated into daily teaching to give full play to the effectiveness of three-dimensional course resource system, network learning platform and mobile learning platform, and guide learners to use rich and complete course resources for independent learning anytime and anywhere.

Build Network Learning Platform and Mobile Learning Platform with Complete Functions

Through the construction of reserve resources and strong interactivity, intelligent management, which has the function of learning good student network learning platform for the learners to use, provide a full assessment of learning resources, learning support services, tutoring, student affairs management, and other services, and on the basis of the training mode of subject navigation services professional course group, stimulate learners' further study, results of ongoing accumulation. Meanwhile, make full use of network learning platform to realize data sharing, resource sharing, storage sharing and interactive sharing of mobile learning platform. Therefore, colleges and universities should coordinate the construction of online learning platform and mobile learning platform, which can realize data sharing, resource sharing, storage space sharing, teaching management and learning behavior sharing. These will greatly promote the application and promotion of curriculum resources, solve the problem of information island, improve learning enthusiasm and improve teaching efficiency.

Conclusion

In the era of "Internet +", three-dimensional course resources provide a complete solution and multiple ways for education and teaching. Based on the three-dimensional course resource system, teachers can practice teaching modes such as "flipped classroom" and "small class system", and students can also carry out experiential learning and ubiquitous learning. Three-dimensional course
resources have become an important part of the connotation construction of college courses and an important measure to improve teaching quality.

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