Research on Curriculum Resource Construction from the Perspective of Education Informatization

-- Take Liaoning Communication University as an Example

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Abstract. As the pace of educational informatization accelerates, the development of course resources has become a critical component in enhancing teaching quality and talent cultivation. This article uses Liaoning Communication University as a case study to explore the current status, challenges, and strategies for course resource development from an educational informatization perspective. By analyzing the achievements and challenges faced by the university in course resource development, targeted improvement suggestions are proposed. The aim is to provide a reference and inspiration for similar institutions, promoting the deep integration of educational informatization and course instruction.

Keywords: Education Informatization; Curriculum Resource Construction; Liaoning Communication University.

1. Overview of the Background of Education Informatization in China

The concept of "education informatization" was first put forward by the Clinton administration in 1993. Its core is to integrate information technology (IT) into the field of education and promote the process of education modernization. The development of education informatization in China has experienced an evolutionary path from local exploration to systematic promotion.

1.1 The Development of Education Informatization in China

In 1989, China promulgated the "Outline of the Overall Plan for the National Educational Management Information System," marking the entry of educational informatization into the policy planning stage. In 1993, the construction of the China Education and Research Network (CERNET) was initiated, laying the foundation for the subsequent widespread adoption of online education. In 2000, the "School-to-School Connectivity" project was fully rolled out. In 2012, the "National Medium- and Long-Term Education Reform and Development Plan (2011-2020)" further clarified the strategic positioning that "information technology has a revolutionary impact on education development." In 2022, China officially launched the strategic initiative for educational digitalization, signaling that educational informatization had entered a new stage of in-depth integration and innovative development.

On January 19, 2025, the Central Committee of the Communist Party of China and the State Council officially issued the "Outline for Building a Strong Education Nation (2024-2035)" (hereinafter referred to as the "Outline") [1]. Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and fully implementing the spirit of the 20th CPC National Congress, the Outline sets the strategic goal of building a strong education nation by 2035. Its core tenets are to adhere to the guiding principles of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, prioritize the development of education, fulfill the fundamental task of fostering virtue and nurturing talent, comprehensively serve the construction of Chinese modernization, accelerate the establishment of a high-quality education system, and cultivate socialist builders and successors who are well-rounded in moral, intellectual, physical, aesthetic, and labor-related aspects, ultimately building a strong education nation with Chinese socialist characteristics that boasts powerful ideological and political guidance, talent competitiveness, technological support, livelihood safeguards, social synergy, and international influence.

Notably, the Outline emphasizes leveraging educational informatization as a crucial technological pillar for building a strong education nation. It advocates driving transformative changes across all educational elements—including concepts, content, methods, and evaluation—through scientific and technological innovation, thereby fostering a new ecosystem of education development led by digitalization. Additionally, it proposes using digital platforms as vehicles to integrate high-quality educational resources, establish a mechanism for recognizing and converting lifelong learning achievements, and promote the deep integration of learning society construction with human resource development.

1.2 The Application of Educational Informatization in Curriculum Construction and Teaching Reform

As a key driver of educational modernization, the application of educational informatization in China's curriculum development has evolved from being merely a technical aid to a deeply integrated approach, forming a three-dimensional application pattern characterized by' technology empowerment, moral education at the core, and resource restructuring.' As a core driving force for educational reform, educational informatization is also reshaping the educational ecosystem through technology empowerment and resource restructuring.

Nearly 90% of primary and secondary schools in China have internet access, with many schools equipped with interactive smart classrooms featuring electronic whiteboards, intelligent teaching terminals, and IoT devices, which support dynamic data collection and immediate feedback. Virtual simulation software is widely used in science and engineering courses, such as chemical molecular structure simulations and physics circuit experiment platforms, to reduce the risks associated with high-risk experiments and enhance the understanding of complex concepts. Universities generally adopt a 'online resources + offline discussions' model, where interdisciplinary courses use IoT sensors to collect data, and students use big data analysis tools to design solutions, achieving a closed loop from theory to technology to practice.

Ideological and political courses use VR technology to recreate historical scenes, such as the virtual simulation of 'Retracing the Long March,' which enhances emotional resonance; the moral education platform uses a campus behavior analysis system to capture students 'mutual assistance behaviors and generate visual reports. Film appreciation courses integrate documentaries like' The Rise of Great Nations,' developing thematic discussion task sheets to guide students in analyzing historical patterns from an international relations perspective [2].

2. The Current Situation of Curriculum Resource Construction in Liaoning Communication University

Educational informatization, a key indicator of educational modernization, is profoundly transforming traditional teaching methods and the educational ecosystem. As the foundation and medium of teaching activities, the level of course resource informatization directly impacts teaching effectiveness and the achievement of talent development goals. Liaoning Communication University, an applied undergraduate institution in media, actively aligns with the trend of educational informatization and is dedicated to the informatization development and utilization of course resources.

2.1 Technology Enables the Construction of Curriculum Resources

2.1.1 Deploy Wi-Fi 7 to Build a 10-gigabit Campus Network

Liaoning Communication University has partnered with Huawei to deploy the first Wi-Fi 7 network in Liaoning's education sector, achieving direct optical fiber connections and 10-gigabit interconnectivity between the southern and northern campuses. The network supports a single terminal speed of 4.3Gbps and an overall system rate of 18.67Gbps, enabling 120 terminals to simultaneously access 1080P high-definition video. This provides high bandwidth and low latency

for smart classrooms and media centers, facilitating the implementation of new teaching models such as virtual simulation experiments and cloud-based lesson preparation. Create smart teaching space.

The college has built more than 60 smart classrooms, equipped with intelligent interactive equipment and cloud management system, supporting remote interactive teaching, learning data retention and real-time analysis; it has also built more than 20 computer rendering workstations and 73 modern practice places, including the provincial satellite TV studio, virtual studio and media convergence center [3].

2.1.2 An Integrated Resource Matrix of "Theory-Practice-Creation"

In the realm of theoretical teaching, by leveraging the intelligent interactive devices in smart classrooms, teachers can utilize a wide range of digital teaching resources, such as high-definition videos and dynamic courseware, to vividly present abstract theories to students, significantly enhancing their interest and comprehension. The data on student performance recorded by the cloud management system also helps teachers accurately assess students' learning progress and identify difficulties, enabling personalized instruction.

In the practical teaching phase, computer rendering workstations and modern practical facilities provide students with ample opportunities for hands-on practice. At venues such as the real-scene studio and virtual studio of provincial satellite TV stations, students can gain firsthand experience of the industry's real workflow, applying their theoretical knowledge to practical operations, thereby deepening their understanding and mastery of professional knowledge.

In the creative stage, students can make full use of their creativity and talent with the help of advanced equipment and resources to complete high-quality media works. Throughout the process, teachers can give real-time guidance and feedback to help students improve their creative level.

This resource matrix breaks the boundary between theory and practice in traditional teaching, and enables students to promote each other and improve together in theoretical learning, practical operation and creative practice, which provides a strong guarantee for cultivating high-quality media talents with innovative spirit and practical ability.

2.2 Build a Teaching Resource Bank with Distinctive Features

2.2.1 Develop Digital Teaching Materials and Curriculum Resources

The college has launched the digital teaching material construction project, integrating text, audio, video, animation and other elements to build an open and shared three-dimensional teaching material system. Relying on the network teaching platform, the course resources are stored in the cloud and updated dynamically, supporting teachers and students to collaborate across time and space [4].

2.2.2 Build a Whole-Process Network Teaching Space

For teachers, it builds a whole-process online teaching platform covering curriculum information management, teaching content design, teaching activity organization, learning analysis and teaching evaluation; for students, it provides personalized learning path planning, online collaboration, real-time feedback and other functions, supporting independent learning and inquiry-based learning.

2.3 Industry-education Integration and Resource Innovation

2.3.1 Construction of Characteristic Teaching Resource Library

Guided by the principles of "user-centric, school-enterprise collaboration, and co-construction and sharing," the college collaborates with industry enterprises to develop a national-level teaching resource library. For instance, the "Fengtian Chengyi" intangible cultural heritage (ICH) club has documented over 20 ICH projects, producing more than 60 documentaries, promotional videos, and short clips, thereby transforming practical industry experiences into dynamic teaching resources.

2.3.2 Promote the Integration of Ideological and Political Courses with Resources

Integrate ideological and political education into the construction of course resources, such as incorporating elements like the spirit of epidemic control and traditional culture into online courses. Through methods like case studies and project-based learning, achieve an organic integration of knowledge transmission and value guidance. The college's course resource development under the perspective of educational informatization vividly demonstrates the deep integration of the goal of moral education and talent cultivation.

2.4 Security and Continuous Optimization

2.4.1 Build a Network Security Protection System

The college has established a network security notification mechanism and monitoring and early warning system, carried out key information infrastructure guarantee, emergency management and other work, formed a network security work pattern involving all staff, and ensured the stable operation of the course resource platform.

2.4.2 Establish a Resource Quality Assessment Mechanism

Through student evaluation and expert review, the scientificity, frontier and applicability of course resources are dynamically evaluated, inefficient resources are eliminated, high-quality content is iteratively upgraded, and a closed-loop management system of "construction, application, feedback and optimization" is formed.

3. Problems and Optimization Strategies in Curriculum Construction of Liaoning Communication University

3.1 Problems Existing in Curriculum Resource Construction

3.1.1 The Quality of Course Resources are Uneven

Although the school has developed a substantial amount of course resources, the quality of some of these resources needs improvement. Some course materials are outdated and fail to reflect the latest industry developments and technological advancements; some teaching videos are poorly produced, with poor picture quality and unclear explanations, which negatively impacts students 'learning experience. Furthermore, the relevance and practicality of these resources need to be enhanced, as some materials are disconnected from actual teaching needs and do not adequately meet students' learning requirements.

3.1.2 The Integration and Sharing of Curriculum Resources are Insufficient

Currently, the school's course resources are scattered across various platforms and systems, lacking an effective integration and sharing mechanism. Resources from different majors and courses struggle to interconnect, leading to redundant construction and waste of resources. Additionally, the level of resource sharing between the school and enterprises, as well as other universities, is low, failing to fully utilize external high-quality resources, which limits the richness and diversity of course resources.

3.1.3 Teachers' Information-Based Teaching Ability Needs to be Improved

The informatization of course resources cannot be achieved without the active participation and professional support of teachers. However, some teachers at Liaoning Communication University have relatively weak skills in information-based teaching, are not proficient in applying information technology in teaching, and lack experience in developing and designing course resources. Some teachers still prefer traditional teaching methods and show little enthusiasm for information-based teaching, which affects the progress and quality of course resource development.

3.1.4 The Construction of Course Resources Lacks a Long-Term Mechanism

The development of course resources is a continuous process that requires the establishment of a long-term mechanism to ensure its smooth progress. Currently, schools lack clear planning and a sustained investment mechanism for the development of course resources, leading to untimely updates and maintenance of these resources. Additionally, there is a lack of effective incentive mechanisms, which results in insufficient rewards and recognition for teachers who excel in the development of course resources, thereby reducing their enthusiasm for participation.

3.2 Strategies for Curriculum Resource Construction of Liaoning Communication University From the Perspective of Education Informatization

3.2.1 Improve The Quality of Curriculum Resources

Strengthen resource review and management: Establish a stringent course resource review system to ensure the quality of resources uploaded to the platform, ensuring that the content is accurate, scientific, and practical. Regularly assess and update course resources, promptly removing outdated or obsolete materials to maintain their timeliness and relevance.

Encourage teachers to innovate in the form of resources: Teachers are encouraged to integrate the characteristics of their subjects and the needs of students, innovating the forms and content of course resources. For example, developing interactive courseware, virtual simulation experiments, online tests, and other new types of resources can enhance students' interest and participation in learning. Additionally, focus on the visual design of resources to enhance their appeal and usability.

3.2.2 Strengthen the Integration and Sharing of Curriculum Resources

To build a unified course resource platform that integrates the school's existing teaching management system, online learning platform, and teaching resource library, to achieve centralized management and sharing of course resources. Through this platform, teachers can easily access and utilize various resources, while students can engage in personalized learning based on their individual needs.

Strengthen cooperation between schools and enterprises, actively collaborate with other universities and companies to establish a course resource sharing alliance. By sharing high-quality course resources, we can achieve complementary strengths and enrich the variety and content of course materials. For example, by collaborating with leading industry enterprises, we can introduce real-world project cases, technical documents, and other resources, providing students with more practical learning materials.

3.2.3 Improve Teachers' Ability of Information-Based Teaching

Conduct information-based teaching training, regularly organize teachers to participate in such training, invite experts and scholars to give lectures and provide guidance, to enhance teachers' understanding and application of information technology. The training content includes online course design and development, information-based teaching methods and strategies, and the use of teaching platforms, helping teachers master the skills and methods of information-based teaching.

Establish an information-based teaching team for teachers, encouraging them to form such teams to jointly develop course resources and conduct research on teaching reforms. Through teamwork, teachers can learn from and exchange ideas with each other, collectively enhancing their information-based teaching skills. Additionally, schools can allocate special funds to support these teams in conducting research projects and practical activities.

3.2.4 Establish a Long-Term Mechanism for Building Curriculum Resources

To formulate a long-term plan for the construction of curriculum resources, schools should define the objectives, tasks and steps of the construction. According to the development of disciplines and the needs of personnel training, the construction of curriculum resources should be promoted in a planned and step-by-step manner to ensure the systematicness and integrity of curriculum resources.

Increase investment and incentives, boost funding for the development of course resources, and ensure adequate financial support for resource development, maintenance, and updates. Additionally, establish an effective incentive system to recognize and reward teachers who excel in course resource development, such as by awarding certificates of honor, providing material rewards, and offering preferential treatment in professional title evaluations, thereby stimulating their enthusiasm and creativity.

4. Summary

The informatization of education has brought new opportunities and challenges to the construction of course resources. Liaoning Communication University has made some progress in this area, but it also faces certain issues and shortcomings. By enhancing the quality of course resources, strengthening resource integration and sharing, improving teachers' information technology teaching skills, and establishing long-term mechanisms, the university aims to further optimize course resource construction, promote the deep integration of educational informatization and course teaching, improve the quality of talent cultivation, and cultivate more high-quality applied talents for the media industry. Additionally, this study provides valuable references and insights for other similar institutions in their course resource construction.

In the future, as information technology continues to advance and educational reforms deepen, the construction of course resources will continue to innovate and improve, injecting new vitality into the development of the education sector.

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