

Exploring How Information-Based Teaching Reforms Drive the Transformation of Talent Cultivation Models in Higher Education Institutions

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ABSTRACT

With the rapid advancement of information technology, society has set higher standards for cultivating talent in higher education institutions. How to leverage information technology to drive reform and innovation in higher education, overcome traditional educational challenges, and enhance the quality of talent cultivation has become a critical issue. Based on this, this paper explores strategic pathways for information-based teaching reform to assist universities in transforming their talent cultivation models. It aims to provide practical insights and references for educational reform in higher education institutions, thereby promoting talent development that better aligns with the demands of contemporary development.

KEYWORDS

Talent cultivation; Information-based teaching reform; Digital evaluation system; Resource assurance

1 Introduction

Emerging information technologies such as cloud computing, big data, and artificial intelligence are profoundly reshaping how people live and work, presenting new opportunities and challenges for higher education development. Rapid shifts in future economic systems and occupational structures demand new competencies from talent—including independent learning, cross-disciplinary integration of diverse skills, critical thinking, and problem-solving abilities. Yet China's current higher education teaching methods remain rooted in industrial-era mass production models focused on "standardized" outcomes, failing to meet society's diverse talent needs. Against this backdrop, deepening information-based teaching reform and advancing the digital transformation of talent cultivation in higher education hold immense value and significance. Integrating information technology into university talent development curricula breaks traditional educational constraints of time, space, and content to facilitate large-scale cultivation of high-quality talent. It enables educators to evaluate talent development, thereby enhancing overall educational quality comprehensively. Based on this, this paper will explore how information-driven teaching reforms can support the transformation of university talent development models, aiming to provide actionable insights and methodologies for educational institutions in the new era.

2 The intrinsic logic of information-based teaching reform and the transformation of talent cultivation models in higher education institutions

2.1 The transformation needs of traditional talent cultivation models in higher education institutions

Over the past few decades, China's higher education institutions have established a highly effective talent cultivation system. Students receive structured knowledge transmission according to standardized curricula within fixed academic years, producing large numbers of graduates with solid professional foundations. This system has supplied substantial talent for the nation's industrialization and modernization efforts. However, with the advent of the digital and intelligent era, society's production methods, lifestyles, and knowledge creation have undergone revolutionary changes. Society and the market now expect university graduates to apply knowledge to create new value. Enterprises require individuals capable of solving complex problems, designing new products, and pioneering new markets ^[1]. Therefore, the primary transformation in university talent cultivation must shift from knowledge transmission to stimulating and nurturing innovative capabilities. Simultaneously, the complex challenges of modern society exhibit cross-domain and interdisciplinary characteristics. While graduates from traditional talent development models excel within their specialized fields, they often encounter limitations such as communication barriers and restricted thinking when collaborating with experts from other domains. This has created a strong societal demand for talent with "cross-domain collaboration" capabilities. Therefore, Universities must consider creating more opportunities for students to learn and gain practical experience within interdisciplinary teams, enabling them to adapt to future real-world work environments during their undergraduate years. Moreover, driven by the digital revolution, new technologies, business models, and industries emerge continuously. The specialized knowledge acquired during a four-year undergraduate program risks

becoming obsolete within a few years after graduation. This necessitates that higher education institutions prioritize cultivating students' potential for lifelong learning.

2.2 Theoretical foundations for the synergistic development of information-based teaching reform and talent cultivation

Constructivist learning theory posits that learners actively construct knowledge through interaction with their environment. Each student enters the classroom with prior experiences and cognitive frameworks. Authentic learning occurs when they mobilize these existing experiences to process new information and solve new problems, forming new, deeper understandings. The traditional "teacher lectures, students listen" model places students in a passive information-receiving role, contradicting constructivist principles. The introduction of information technology, such as online collaboration platforms, enables students from different regions to jointly conduct research, design solutions, and present outcomes for a single project, thereby constructing a multidimensional understanding of the problem. Thus, information-based teaching reform provides the technological foundation for implementing constructivist principles, returning the learning initiative to the students. Personalized education theory acknowledges and respects each student as unique, recognizing inherent differences in learning interests, cognitive styles, prior knowledge bases, and learning speeds^[2]. Teachers struggle to provide precise attention to each individual in large classes of dozens of students. Information technology solves this challenge: all student learning activities on innovative learning platforms can be recorded and analyzed, enabling them to access the most suitable learning resources, practice exercises, and supplementary materials. Students can overcome challenges at their own pace, laying a solid foundation for their future growth and development.

3 Practical pathways for higher education talent cultivation model transformation through information-based teaching reform

3.1 Reconstructing a curriculum system integrating technology and content

Under the framework of information-based teaching reform, instructors can adopt a talent cultivation model combining "online theoretical instruction with offline simulation-based practical training" for core professional courses. First, instructors deliver foundational content through MOOCs or animated micro-lectures. Students then review challenging sections at their own pace and reinforce learning by completing online concept assessments. During in-person sessions, students focus on simulation-based experiments. This involves operating complex chemical processes and implementing process control within a highly realistic virtual plant for chemical engineering majors. Students safely adjust critical parameters like reaction temperature and pressure, receiving immediate feedback on final yield and product quality to deepen theoretical understanding. To cultivate cross-disciplinary collaboration, instructors should leverage innovative teaching platforms to integrate high-quality resources from multiple departments—including computer science, management, and design—to establish comprehensive projects. Students form virtual teams to jointly complete tasks on the platform: market research, technical solution design, virtual prototyping, and business plan development. The platform automatically records every discussion and decision-making process, providing feedback on shortcomings and optimization suggestions. Ultimately, students will naturally learn to respect different disciplinary thought patterns while mastering cross-disciplinary communication skills throughout the project.

3.2 Innovating student-centered teaching organization

The deepening of information-based teaching reforms provides abundant tools for innovative teaching organizations. Instructors can utilize live interactive tools to invite industry experts and scholars for online sharing, enriching students' knowledge. Interactive tools like real-time comments, polls, and cloud-based Q&A provide equal opportunities for students who hesitate to raise their hands in traditional classrooms to express opinions and ask questions, thereby boosting their learning engagement. After class, group collaboration platforms are the primary hub for student teams to complete project tasks. They can asynchronously share resources, brainstorm ideas, and gradually familiarize themselves with remote collaboration models in the digital age. Teachers can also leverage innovative learning platforms to monitor student progress. Based on platform-generated learning reports, they can identify students facing learning difficulties and those ready for advanced development. Educators can focus more on personalized tutoring, in-depth Q&A sessions, and emotional guidance. Ultimately, students can grow at their own pace, significantly enhancing their self-directed learning abilities and confidence^[3].

3.3 Establishing a multidimensional and process-integrated digital assessment system

Teachers should fully leverage information-based assessment systems to construct evaluation frameworks integrating knowledge, skills, and competencies. Regarding knowledge mastery, the system provides real-time learning feedback, enabling teachers and students to understand current learning progress intuitively. For skill development, students use the system to review peers' work activities and design outcomes against established standards, assigning scores. The platform can also suggest improvements, thereby guiding the development of critical thinking, evaluation skills, and a sense of responsibility. Learning behavior data can indirectly reflect the cultivation of deeper qualities such as hands-on skills, team spirit, learning perseverance, and motivation. Teachers can also monitor class learning progress in real time on the innovative platform, identify common learning challenges, and pinpoint areas for individual student advancement. This enables them to adjust teaching strategies and provide targeted learning support. Students can access their personalized learning data reports anytime to understand their strengths and areas for improvement, enabling them to adjust their learning strategies. This multidimensional, process-integrated digital assessment facilitates dynamic monitoring and optimization of talent development quality, helping education return to its fundamental purpose of fostering holistic human development.

4 Support system for information-based teaching reform to facilitate the transformation of higher education talent cultivation models

4.1 Hardware and resource support system

Under information-based teaching reform, establishing a robust and stable information support and resource system can promote the successful transformation of higher education talent cultivation models and facilitate high-quality talent development. Specifically, regarding hardware support, comprehensive wireless network coverage with strong transmission and anti-interference capabilities should be ensured throughout all campus areas—including classrooms, libraries, laboratories, and other indoor/outdoor spaces. Simultaneously, traditional multimedia classrooms should undergo intelligent upgrades, including installing interactive smart displays and enabling instructors to project content wirelessly from electronic devices and screens ^[4]. Virtual simulation labs should be established with high-performance computers and specialized simulation software for hands-on disciplines like engineering, medicine, and biology. This allows medical students to perform dissections and simulated surgeries on virtual operating tables, and enables mechanical engineering students to disassemble precision engines to enhance practical skills. Additionally, universities should establish a high-quality, comprehensive, and easily accessible digital teaching resource repository. This repository should include premium course video resources, exemplary lesson plans, courseware from faculty across departments, real-world case studies from industry-leading enterprises, interdisciplinary research reports, and electronic literature. All resources should be freely accessible to all faculty and students through a unified intelligent teaching resource management platform, supporting their learning, teaching, and research needs.

4.2 Institutional framework and faculty support system

The transformation of higher education talent cultivation models requires institutional safeguards. Universities must establish specific application criteria and project approval standards, continuously encouraging individual faculty members and teaching teams to submit proposals. Selected projects should be granted autonomy to adjust teaching methods, approaches, and evaluation systems. Concurrently, institutional promotion systems should explicitly recognize that high-quality information-based teaching development, premium online teaching resource creation, and related pedagogical research achievements hold equal value to traditional research papers or projects. Annual dedicated funding should be allocated for specialized information-based teaching reforms, ensuring stable financial support for equipment maintenance and upgrades, resource procurement and development, and faculty training incentives. Regarding faculty support, training for new educators should prioritize teaching skills in interactive software for online course platforms and learning analytics systems to enhance classroom efficiency. For experienced educators, address gaps in operational skills related to virtual laboratories, innovative teaching technologies, and information technology. This enables them to leverage these tools better to improve teaching quality and cultivate more high-caliber talent ^[5]. Additionally, a teaching team comprising educational technology experts and outstanding frontline instructors should be established to provide technical consultation and instructional design services for the entire university community, thereby sustaining multidisciplinary talent's sustained development.

5 Conclusion

Against the backdrop of information-driven educational reform, universities can cultivate high-quality talent better suited to the demands of the digital age by: Reconstructing curricula that deeply integrate technology and content; Innovating student-centered teaching methodologies; Establishing multidimensional formative assessment systems; Building robust hardware infrastructure and institutional faculty support mechanisms. Information-based teaching reform will deepen further as technologies like artificial intelligence and big data evolve. Future exploration should focus on achieving personalized learning more intelligently and evaluating students' comprehensive abilities more scientifically, thereby continuously advancing higher education's development and quality enhancement.

About the Author

Jie Zhou, female, Han ethnicity, from Qufu, Shandong Province. Zhou Jie holds a doctorate and is a lecturer at the School of Finance, Shandong Technology and Business University. Research interests: digital transformation, green finance.

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