Chen Yichen

2nd year student of PHD

Moscow Pedagogical State University

Moscow

CONSTRUCTION OF THE DIGITAL TRANSFORMATION SYSTEM IN HIGHER EDUCATION INSTITUTIONS AND ITS IMPLEMENTATION PATHWAYS

Abstract*: in the context of rapid advancements in information technology, digital transformation has become a pivotal trend in the development of higher education. As key institutions for cultivating high-quality talent, universities and colleges must actively establish digital transformation systems to enhance educational quality and promote scientific innovation. In the article the construction of a digital transformation framework for higher education institutions and proposes practical implementation pathways, aiming to provide actionable insights for universities.*

Keywords*: digital transformation, higher education institutions, implementation pathways.*

The author expresses his deepest gratitude to the supervisor of the Jessore, Tamara Ivanovna Berezina, for her unwavering patience, invaluable guidance and constant support throughout the study. Her deep experience, critical views, and meticulous attention to detail played an important role in shaping the academic rigor and clarity of this work. The author is truly inspired by her commitment to scientific excellence and her desire to develop independent thinking. This achievement would not

have been possible without her mentoring.

Чэнь Ичэнь

аспирант

ФГБОУ ВО «Московский педагогический государственный университет»

г. Москва

DOI 10.31483/r-138041

ПОСТРОЕНИЕ СИСТЕМЫ ЦИФРОВОЙ ТРАНСФОРМАЦИИ В ВЫСШИХ УЧЕБНЫХ ЗАВЕДЕНИЯХ И ПУТИ ЕЕ ВНЕДРЕНИЯ

Аннотация*: в условиях стремительного развития информационных технологий цифровая трансформация стала ключевой тенденцией в развитии высшего образования. Университеты и колледжи как ключевые учреждения для подготовки высококвалифицированных кадров должны активно внедрять системы цифровой трансформации для повышения качества образования и продвижения научных инноваций. В статье рассматривается создание системы цифровой трансформации для высших учебных заведений, и предлагаются пути практической реализации, направленные на предоставление университетам полезной информации.*

Ключевые слова*: цифровая трансформация, высшие учебные заведения, пути внедрения.*

Автор выражает свою глубочайшую благодарность научному руководителю Джессору Тамаре Ивановне Березиной за ее непоколебимое терпение, неоценимое руководство и постоянную поддержку на протяжении всего

исследования. Ее глубокий опыт, критические взгляды и скрупулезное внимание к деталям сыграли важную роль в формировании академической строгости и ясности этой работы. Автор по-настоящему вдохновлен ее стремлением к научному совершенству и стремлением развивать независимое мышление. Это достижение было бы невозможно без ее наставничества.

1. Research Background

In the new era, the digitalization of education serves not only as a cornerstone for achieving educational modernization, but also as a critical breakthrough for nations to pioneer new frontiers in educational development and cultivate competitive advantages. Against this backdrop of accelerating digital transformation in education, many higher education institutions still face significant challenges when constructing their digital transformation frameworks.

1. Integration Gaps: some institutions exhibit deficiencies in both technological understanding and application, coupled with a narrow perspective on digital integration.

2. Resource Quality: substandard digital teaching materials fail to meet students' diverse learning needs.

3. Faculty Readiness: many educators lack sufficient digital literacy, teaching skills, and awareness of utilizing digital resources effectively.

4. Infrastructure Shortcomings: incomplete digital campus systems and inadequate management platforms hinder progress.

2. Strategies for Building a Digital Transformation System.

1. Clarify Goals and Planning:

Higher education institutions must first define the overarching strategic objectives

of digital transformation, including goals for teaching, research, and administration. They should then develop detailed digital transformation plans tailored to their specific circumstances, clearly outlining implementation steps, timelines, and expected outcomes.

2. Strengthen Infrastructure Development:

Institutions should increase financial and technological investment to enhance the efficiency and security of core infrastructure such as campus networks and data centers. By adopting advanced information technologies-including cloud computing, big data, and artificial intelligence-they can build intelligent, user-friendly, and digitally integrated campus ecosystems.

3. Optimize Digital Services:

Universities should actively promote high-quality digital teaching resources and services, such as online courses and virtual laboratories, to comprehensively improve instructional quality and efficiency. Additionally, they must develop robust digital management platforms to enable fully digital and intelligent administration of academic affairs, research activities, and student services.

4. Enhance Talent Development and Team Building:

Higher education institutions should intensify training programs to improve faculty and staff's digital literacy and technical application capabilities. They must actively recruit and cultivate professionals who possess both digital skills and innovative thinking, thereby solidifying the talent foundation for achieving digital transformation goals.

5. Deepen Digital Application and Innovation:

Institutions should continuously explore application scenarios of digital

technologies in teaching, scientific research innovation, and administrative decision-making. They should encourage both faculty and students to participate in digital innovation projects and related practical activities, jointly promoting the in-depth development of digital transformation.

6. Build an Open and Shared Digital Ecosystem:

Universities should strengthen cooperation and exchange with other institutions, research organizations, and enterprises to share digital resources and experiences. This will foster an open, inclusive, resource-sharing, and collaborative digital ecosystem.

3. Implementation Pathways.

Based on the above analysis, the author proposes an implementation pathway for the digital transformation system in higher education institutions, developed from four key dimensions: digital teaching infrastructure, faculty digital teaching capabilities, digital teaching models and methods, and student digital literacy.

1. Strengthening the Development of Digital Education Infrastructure

First, ensuring network security lays the foundation for digital education. As institutions build their digital transformation systems, robust cybersecurity measures are essential to maintain campus network stability, safety, and high-speed connectivity. These measures guarantee adequate bandwidth and comprehensive coverage to meet the demands of online education.

Second, virtual laboratory technology serves as a powerful tool to diversify teaching methods and facilitate resource sharing. By implementing virtual labs, universities can create immersive, realistic, and secure simulated learning environments. This allows students to conduct scientific experiments, physics simulations, and engineering

design exercises without physical equipment or materials, thereby deepening their understanding of theoretical principles and honing practical skills.

Third, a well-developed digital education resource repository consolidates and optimizes diverse educational materials, providing critical content support for digital learning. In constructing such repositories, institutions should leverage advanced information technologies to integrate, refine, and share resources, offering students a rich variety of materials for self-directed learning.

With a stable, high-speed, and secure network infrastructure in place-complemented by virtual lab technology and comprehensive digital resource banks-universities can significantly enhance their digital education ecosystems.

2. Enhancing Faculty Digital Teaching Competencies

To effectively strengthen instructors' digital teaching capabilities, universities should implement structured capacity-building initiatives. First, institutions can organize regular training programs led by experts in digital education or exemplary practitioners, equipping faculty with essential pedagogical techniques and technological proficiencies. These sessions should focus on hands-on skill development rather than theoretical overviews.

Second, establishing professional learning communities dedicated to digital education allows faculty to collaboratively explore methods for integrating emerging technologies into instruction. Within these communities, educators can share curated teaching resources and troubleshoot classroom challenges through peer-led discussions, fostering collective problem-solving.

Finally, implementing an innovation incentive system proves critical for

sustaining momentum. Institutions should formally recognize and reward faculty who demonstrate excellence in developing innovative teaching models, transforming traditional curricula into digital formats, or creating high-quality digital learning materials. Tangible rewards coupled with public recognition serve dual purposes: they validate pioneering efforts while motivating broader faculty engagement, ultimately elevating institutional digital teaching standards systemwide.

This multi-pronged approach-combining skill-building workshops, collaborative communities, and motivational incentives-creates an ecosystem where digital teaching competencies flourish organically rather than through top-down mandates.

3. Innovating Digital Teaching Models and Methodologies

The digital transformation of higher education demands proactive pedagogical innovation from faculty. First, instructors should pioneer blended learning models that combine the best of traditional and digital approaches. For instance, integrating the BOPPPS framework (Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, Summary) with Problem-Based Learning (PBL) and Team-Based Learning (TBL) creates a robust student-centered ecosystem. This synthesis not only fosters self-directed knowledge acquisition but simultaneously develops students' digital fluency and problem-solving competencies.

Second, institutions must leverage educational technology to transition from standardized «tracked instruction» to genuine personalized learning. Advanced analytics tools enable instructors to perform comprehensive learner profiling-assessing subject mastery, learning preferences, and cognitive patterns-then craft tailored study plans using these data-driven insights. This shift from «one-size-fits-all» to «precision

education» represents the true promise of digital transformation.

Third, AI-powered assessment systems should be implemented institution-wide. These platforms provide real-time monitoring of student progress, automated performance evaluation, and just-in-time intervention recommendations. By identifying knowledge gaps and suggesting corrective measures at optimal moments, such systems create continuous feedback loops that dramatically improve learning outcomes while reducing instructor workload.

This triad of innovations-blended learning design, data-informed personalization, and intelligent assessment-forms the cornerstone of next-generation digital pedagogy in higher education.

4. Cultivating Students' Digital Literacy

Developing students' digital competencies requires a structured, multi-faceted approach. First, faculty must establish clear, measurable learning objectives tailored to students' developmental levels and disciplinary contexts. Beyond basic technical skills-such as navigating learning management systems-these objectives should emphasize strategic use of digital resources to address individual learning gaps, transforming online platforms from passive content repositories into active tools for self-directed improvement.

Second, institutions should champion project-based learning (PBL) initiatives that integrate digital technologies with real-world problem solving. Competitive programs like the National Undergraduate Mathematical Contest in Modeling serve as ideal platforms, where students apply computational tools to complex challenges while developing critical digital workflows. Such experiences not only future-proof graduates' skill

sets but also bridge the often-cited gap between academic knowledge and workplace digital demands.

Finally, implementing a comprehensive digital literacy assessment framework enables dual outcomes: systematically evaluating students' technological competencies while informing personalized development pathways. This data-driven approach ensures continuous improvement, allowing institutions to calibrate instruction based on evolving digital proficiency benchmarks rather than static curricular requirements.

4. Conclusion

In summary, the digital transformation of higher education represents an imperative strategic response to contemporary educational demands-one that simultaneously enhances instructional efficacy and elevates learning outcomes. Only through the successful implementation of comprehensive digital transformation frameworks can faculty gain streamlined access to diverse pedagogical resources while leveraging cutting-edge technologies to augment both curriculum delivery and student engagement.

References

1. Liu Q., Li Zh. Implementation Pathways of Digital Transformation for Building a High-Quality Education System // East China Science and Technology. 2024. No. 10. P. 128–130.

2. Zhao W., Zhang L. Digital Transformation Empowers Chinese-Style Modernization of Basic Education: Opportunities, Challenges and Countermeasures // Theory and Practice of Education. 2024. No. 44(01). P. 3–9.