

Current Situation, Problems, and Strategies of Digitalization in Higher Education in Jiangsu Province

Fei Ruan¹, Wenjuan Chen²

¹School of Literature and Law Wuxi Taihu University, Wuxi, Jiangsu, 214064, China

²Academic Affairs Office Wuxi Taihu University, Wuxi, Jiangsu, 214064, China

ABSTRACT

Based on the analysis of typical application scenarios, outstanding cases, and annual innovation cases of educational digitalization in Jiangsu Province in 2024, this article systematically examines the current development situation, existing problems, and corresponding strategies for the digitalization of higher education in Jiangsu. Significant achievements have been made in policy planning and infrastructure, teaching innovation and application practices, resource platforms, and teacher-student development. However, challenges remain, such as imbalances in regional and inter-university development, superficial integration of technology, and insufficient digital literacy and training mechanisms for teachers and students. This article proposes practical strategies including strengthening overall planning and classified guidance, deepening the integrated innovation of technology and education, and enhancing the digital literacy and skills of teachers and students. These strategies are interconnected and mutually supportive, collectively forming a systematic path to promote the high-quality development and transformation of digitalization in Jiangsu's higher education.

KEYWORDS

Jiangsu province; Higher education; Digitalization; Practical strategies

1 Research background

Currently, the wave of digitalization is sweeping the globe, and educational digitalization has become a core driving force for the reform and development of higher education. Jiangsu Province, as an important base for higher education in China, has always been at the forefront of national practices in educational digitalization. In early 2023, the Jiangsu Provincial Department of Education issued the "Opinions on Vigorously Promoting the Digitalization of Teaching in Higher Education Institutions"^[1] (hereinafter referred to as the "Opinions"), which innovatively designed the basic principles for promoting digitalization in the field of university teaching and, for the first time, formulated basic norms for digitalized teaching, providing systematic guidance for the digitalization of higher education across the province.

According to the typical application scenarios and outstanding cases of educational digitalization in Jiangsu Province announced in 2024^[2], and the annual innovation cases^[3], universities in the province have formed 55 representative innovation cases. These cases collectively reflect the phased achievements and development trends in the process of promoting educational digitalization in Jiangsu's higher education institutions. Based on these cases, this article systematically analyzes the current development situation, existing problems, and proposes targeted solutions, aiming to provide reference for the development of higher education digitalization in Jiangsu Province and nationwide.

2 Current development situation of digitalization in Jiangsu higher education

2.1 Policy planning and infrastructure

Jiangsu Province's leading position in the field of higher education digitalization benefits from its forward-looking layout and continuous investment. At the policy level, the "Opinions" issued in 2023 clarified the basic principles of "education as the foundation, technology empowerment, collaborative sharing, and characteristic innovation"^[4]. It set the near-term goal of reaching the national leading level in digitalization by 2025, and the long-term goal of forming an innovative paradigm for digitalized teaching in higher education with Jiangsu characteristics and international influence by 2030.

In terms of infrastructure, Jiangsu has built a widely radiating digital new infrastructure system. Over 90% of higher education institutions in the province have built provincial-level smart campuses, establishing a five-level education data aggregation and exchange hub connecting the national, provincial, municipal, county, and school levels^[5]. The provincial higher education smart platform has guaranteed online learning for 30 million person-times, and the virtual simulation experiment teaching sharing platform has served 3.43 million person-times in virtual simulation experiments^[6].

2.2 Teaching innovation and application practices

Jiangsu's higher education institutions have made significant progress in digital teaching innovation. The typical cases

announced in 2024 show that Jiangsu universities have explored a number of effective practices in virtual simulation teaching, remote interactive classrooms, and intelligent training. Nanjing Medical University's "New System of Medical Functional Experiments Based on Functional Digital Humans" constructs a highly simulated experimental environment through digital twin technology, solving the problems of high risk and high cost in medical experiments. Southeast University's "Integration of Virtual and Real, Cross-domain Intelligent Connection—The Southeast University Practice of Digital Transformation and Resource Sharing in Civil Engineering Experiment Teaching" achieves the sharing and optimal allocation of cross-regional experimental teaching resources.

In terms of teaching model innovation, Jiangsu universities have explored various forms of digital teaching. Nanjing University of Posts and Telecommunications has built a blended creation and sharing teaching space supporting blended teaching, virtual simulation experiments, 360-degree real-scene teaching, and other forms. The School of Marxism at Southeast University uses VR technology to conduct ideological and political theory courses, where students enter the teaching scene of "the Red Army crossing the grassland" by wearing VR equipment, achieving an innovative breakthrough in the form of ideological and political education. Jiangnan University has created a "Future Classroom" [7], integrating real industrial sites into the classroom in real-time, allowing students to combine theoretical knowledge with practical application.

2.3 Resource platforms and teacher-student development

Jiangsu has achieved remarkable results in the construction of digital resource platforms. The provincial higher education smart platform has gathered over 1,800 first-class online open courses, opened 586 virtual simulation experiment teaching projects, and pushed more than 200 national-level first-class courses to the National Smart Education Platform.

In terms of teacher development, Jiangsu attaches importance to the improvement of teachers' digital teaching ability. In addition to the "Cloud Academy" platform, many universities have carried out targeted training. Soochow University implemented a series of "Digital Empowerment for Teachers" training activities and the "Golden Teacher Workshop" brand project. Nanjing University compiled the "Blended Online and Offline Teaching Training Guide" and held blended teaching training camps to systematically enhance teachers' digital teaching ability.

At the student development level, digital empowerment has shown obvious effects. Nanjing University constructed the "New Student Adaptation Education System Empowered by Digital Factors," helping freshmen better adapt to university life. Jiangsu Normal University's "i-Star" platform assists the school's digital transformation, providing students with personalized learning support. These cases indicate that digitalization is profoundly influencing students' growth paths and learning methods.

3 Problems and challenges in the digitalization of Jiangsu higher education

3.1 Regional development and inter-university imbalances

There is a clear problem of unbalanced regional development in the digitalization of higher education in Jiangsu Province. Judging from the distribution of cases announced in 2024, the number of cases from universities in Southern Jiangsu is significantly higher than that in Northern Jiangsu. The proportion of cases from universities in the provincial capital, Nanjing, is high, while cases from non-central cities are relatively few. This regional disparity reflects the geographical divide in the digitalization of higher education in Jiangsu, mainly due to differences in regional economic development levels leading to uneven financial investment, varying degrees of digital infrastructure construction, and regional differences in the digital literacy of teachers and students.

At the same time, there is also a gap in the level of digital construction between different types of universities. Undergraduate universities invest more in digital teaching innovation and research support, while vocational colleges, although having characteristic advantages in areas like virtual simulation training, have relatively insufficient resource investment in high-end platforms and intelligent equipment. Furthermore, the degree of digital application among different departments within universities is also uneven. Digital application is deeper in teaching and research fields, while the integration of digitalization in management and service fields is relatively lagging.

3.2 Superficial integration of technology

Most cases show that current digital teaching applications are still at the level of instrumental substitution, that is, using digital technology to replicate or optimize traditional teaching processes, without truly triggering structural changes in the education model. The lag in educational concepts is the underlying reason for the shallow integration of technology. Some teachers regard digitalization as a teaching aid tool rather than an opportunity for the reconstruction of the educational ecology.

Virtual simulation teaching, as a hot field in educational digitalization, also faces problems of integration depth. Most

virtual simulation projects focus on the simulation and repetitive training of operational procedures, lacking cultivation of higher-order cognitive abilities such as complex problem-solving skills and innovative thinking.

In terms of digital teaching evaluation, although several universities in Jiangsu have attempted to use big data technology for learning analytics, most evaluations still remain at the measurement of knowledge mastery and skill proficiency. An evaluation system for core literacies such as critical thinking, collaboration ability, and innovative consciousness has not yet been established. The feedback application of evaluation results is also mostly limited to personalized exercise recommendations, lacking deep adjustment guidance for teaching design.

3.3 Insufficient digital literacy and training mechanisms

Insufficient digital literacy of teachers and students and imperfect training mechanisms are the third major challenge for the digitalization of higher education in Jiangsu. It can be seen from the cases that the implementation effect of digital teaching projects largely depends on the teachers' technical application ability and instructional design ability. However, there is a obvious stratification phenomenon in the digital literacy of teachers in Jiangsu's higher education institutions: a few teachers can innovatively integrate technology into teaching, most teachers can only perform basic applications, and some teachers still have technical application barriers[8].

At the student level, the gap in digital literacy is also evident. Although students in Jiangsu universities generally possess basic digital device operation skills, the skills to use digital technology for deep learning, critical thinking, and the development of higher-order thinking abilities are still insufficient. Most students are more accustomed to passively receiving digital learning resources rather than using technology for active exploration and knowledge construction.

In terms of training mechanisms, although Jiangsu has established a provincial-level teacher training system, such as launching the "Cloud Academy" for university teachers' teaching ability development, the training content emphasizes technical operations and lacks integration with subject teaching; the training form is mainly based on centralized lectures, lacking personalized and continuous support.

4 Practical Strategies for Promoting Digitalization in Jiangsu Higher Education

4.1 Strengthen overall planning and classified guidance

To address the problems of regional development and inter-university imbalances, Jiangsu should strengthen the top-level design and differentiated guidance for the digitalization of higher education, clarifying the development goals, key tasks, and safeguard measures for the next 5-10 years. Planning should pay special attention to balanced regional development, establishing special support funds to support digital construction in Northern Jiangsu and weaker universities.

For the development gap between universities, the establishment of digital alliances should be encouraged, allowing advanced universities to drive backward universities, achieving resource sharing and cooperative development. For example, advanced universities in digital construction like Nanjing University and Southeast University can pair up with universities in Northern Jiangsu for cooperative construction, sharing high-quality digital resources and successful experiences. At the same time, a monitoring and evaluation system for the development of higher education digitalization in the province should be established, regularly issuing development reports to form a dynamic adjustment and improvement mechanism.

4.2 Deepen the integrated innovation of technology and education

To solve the problem of insufficient depth in the integration of technology and education, Jiangsu should adopt a dual-wheel drive strategy of "application-driven" and "model innovation." On the one hand, it should adhere to the orientation of actual educational needs, avoiding the blind application of "technology for technology's sake." On the other hand, it should encourage the innovation of teaching models and evaluation models to truly unleash the potential of digital education.

In terms of teaching model innovation, universities should be encouraged to explore new teaching models such as AI-based personalized learning path planning, big data-based learning situation diagnosis and intervention, and virtual simulation-based situational learning. These practices should be promoted throughout the province, establishing cross-university experience-sharing mechanisms.

In terms of evaluation model innovation, the advantages of digital technology should be fully utilized to improve outcome evaluation, strengthen process evaluation, explore value-added evaluation, and complete comprehensive evaluation. The student comprehensive quality evaluation system in the digital environment should be further explored, breaking the single evaluation model of solely focusing on scores.

4.3 Enhance digital literacy and skills of teachers and students

To address the insufficient digital literacy of teachers and students, Jiangsu should build a multi-level and comprehensive digital literacy improvement system. For teachers, a digital literacy improvement mechanism covering the entire cycle of pre-service training, induction training, and in-service development should be established. At the provincial level, the "Cloud Academy" for the teaching ability development of Jiangsu university teachers can be improved, increasing the proportion of digital teaching ability training courses. The training content should shift from single technical operations to integrated instructional design.

For students, the cultivation of digital literacy should be integrated into the talent training programs of various disciplines, offering specialized information technology courses and integrating digital literacy requirements into professional teaching. Universities should strengthen digital ethics education, enabling students to possess the awareness and ability to use technology responsibly. Especially in the application of emerging technologies such as artificial intelligence and big data, ethical norm education should be strengthened to cultivate students' sense of technological responsibility.

5 Research Limitations and Prospects

This research still has certain limitations: Firstly, the results based on policy documents and case analysis, while reflecting the innovative practices of digitalization in Jiangsu's higher education, are difficult to comprehensively cover the actual situation of all universities; Secondly, educational digitalization is developing rapidly, with new technologies and applications constantly emerging, requiring continuous tracking research; Thirdly, the long-term effects of educational digitalization require time to test, and short-term analysis is difficult to fully assess its impact.

Educational digitalization is a profound educational reform involving multi-dimensional comprehensive innovation in technology, institutions, and culture. Jiangsu should take the opportunity of the provincial pilot of the National Smart Education Platform, adhere to the principle of educating students as the foundation, strengthen technology empowerment, focus on co-construction and sharing, encourage characteristic innovation, and solidly promote the transformation and upgrading of higher education digitalization, empowering and assisting in the construction of a high-quality education system and a high-standard education strong province.

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About the Author

1. Fei Ruan, Female, Associate Professor, School of Literature and Law, Wuxi Taihu University, Master's Degree, Research direction: higher education teaching reform and tourism culture.
2. Wenjuan Chen, Female, Lecturer, Academic Affairs Office, Wuxi Taihu University, Master's Degree, Research direction: higher education management and applied linguistics.

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