

Research on Innovation of University Education Management Model under the Background of Digital Transformation

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Abstract: Digital transformation is profoundly reshaping the ecosystem of university education management. In response to the prominent problems such as information silos, delayed decision-making, and fragmented services in the traditional management model, this paper proposes three innovative paths: data-driven precise teaching governance, cross-departmental one-stop service platform construction, and accompanying evaluation of teachers and students through digital portraits. By integrating the entire teaching cycle data chain, reconfiguring business processes, and establishing dynamic evaluation models, this paper promotes the transformation of university management from an experience-based model to a data-intelligent model. The research shows that this model can significantly improve management efficiency and the accuracy of education, providing an operational framework for the digital transformation of higher education.

Keywords: Digital transformation; University management; Precise governance; One-stop service; Digital portrait

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1. Introduction

The “Ten-Year Development Plan for Education Informationization (2011–2020)” (hereinafter referred to as the “Plan”) has clearly set the development goals for higher education informatization, stating that “promoting the reform and innovation of higher education and improving quality is an effective way to promote the development of education informatization, and it is the cutting-edge of innovation in education informatization”. The digital transformation of education has become a national strategy in China. As the main battlefield for talent cultivation, the innovation of university management is urgent. Currently, many universities still have problems of fragmented systems in the departments of teaching affairs, student affairs, and logistics, as well as difficulties in data interoperability; management decisions rely on experience rather than real-time data, and students and teachers are facing the pain point of multiple departments’ repeated running errands. How to restructure management processes using big data, cloud computing, and artificial intelligence, and shift from control to service and from extensive to precise is an urgent issue that needs to be addressed. This paper focuses on three core paths.

2. Precise teaching governance mechanism driven by data

This mechanism focuses on breaking through the entire teaching process data chain, conducting closed-loop management from recruitment to training and graduation employment. Each university needs to build a school-level data platform, integrating multi-source information such as the teaching management system, online learning platform, smart classroom perception data, and library borrowing records, and establishing a unified database of students' learning behaviors ^[1]. On this basis, a teaching warning model is constructed: when the student's class attendance rate continuously falls below 70%, the homework submission delay exceeds three times, or the online learning duration drops sharply, the system automatically sends attention reminders to the counselors and instructors. At the same time, it provides teachers with a heat map of class learning situation, visually presenting the weak points in knowledge mastery and assisting teachers in adjusting teaching strategies. Data governance also requires standardized data collection and cleaning regulations to ensure reliable analysis results. This mechanism shifts the focus of management from post-event remediation to process intervention, truly making teaching management a powerful tool for improving the quality of education. Universities should strengthen data security hierarchical management, determine the access rights of teaching data, and strictly regulate the process of teachers and administrators accessing and using data in the background to prevent the leakage of students' privacy information, and build a security defense line for the compliant use of data. At the same time, provide digital practical training for teaching managers and frontline teachers, enhancing the comprehensive capabilities of all staff in data analysis, platform operation, and precise assistance, and truly achieving the practical effect of data empowerment. With a long-term data review mechanism as support, regular summaries of learning situation big data are conducted, and the talent cultivation plan, curriculum system setting, and classroom arrangement are optimized in reverse, promoting the dynamic iteration and improvement of teaching governance, and comprehensively creating a scientific, precise, and intelligent new model of university teaching governance.

3. Construction of cross-departmental one-stop service platform

The one-stop service platform aims to break down departmental barriers and centrally handle and integrate the service matters scattered among the academic affairs office, student affairs office, finance office, and logistics office. The platform adopts the model of "front desk unified acceptance, back-end classification approval, and window unified feedback", allowing students and teachers to complete over a hundred business items such as student status changes, scholarship applications, classroom borrowing, and reimbursement approval through a single-entry point ^[2]. The key technical support mainly includes business process reengineering and data exchange sharing, simplifying and standardizing the original approval process and eliminating redundant signature procedures; through interface technology, data is synchronized in real time between different systems to avoid users repeatedly submitting applications. The platform should also be equipped with intelligent customer service robots to answer common questions 24/7, and automatically transfer complex matters to human processing and track the progress of handling. During implementation, efforts should be made to overcome the resistance of cross-departmental collaboration, proposing to establish a special working group led by school leaders, a service list, and a time-limited completion system, etc. After the platform is launched, the average processing time for business can be reduced from several days to several hours, and the satisfaction of teachers and students has also significantly improved.

4. Accompanying evaluation system for teachers and students' digital portraits

Digital portraits dynamically and intuitively present the development status of teachers and students, breaking the limitations of one-time examinations or annual evaluations, and covering aspects such as academic performance, second-class courses, behavioral habits, psychological qualities, and practical abilities for students. They are presented in a radar

chart format to visually show strengths and weaknesses, generating personalized development recommendation reports for each student^[3]. This system uses learning analysis technology to track micro-behaviors such as student activity levels and experimental operation accuracy during course discussions, discovering potential innovative trends or academic risks. For teachers, the portraits integrate teaching workload, student evaluation, research achievements, and participation in teaching reforms, helping colleges accurately carry out teacher training and title evaluation work. The core concept of the accompanying evaluation is “accompanying” rather than “ending”: through real-time update of portrait data, a growth report will be generated each semester to guide students and teachers to conduct self-reflection and set goals. Privacy protection is a prerequisite for the system, and all data collection and utilization must be subject to the consent of the individual and de-identification. The assessment results are only used as developmental support and not as ranking penalties.

5. Implementation approaches of personalized stratified teaching in the context of digital intelligence enabling

Based on digital technologies such as big data and artificial intelligence, building a differentiated teaching implementation system is a key support for achieving high-quality development of university teaching in the new era. Based on previous teaching governance data and the analysis results of teachers and students’ digital portraits, considering the differentiated characteristics of students in terms of knowledge foundation, learning ability, cognitive rhythm, and development needs, scientifically divide the learning levels and implement precise and personalized stratified teaching models. With the support of the smart teaching platform, the school will integrate diverse resources such as high-quality micro-lessons, expanded exercises, stratified question banks, and personalized learning task lists, providing gradient learning content for students of different levels to achieve individualized teaching. Teachers will use the feedback of learning data to accurately identify the overall weaknesses and individual learning differences of the class, and design stratified plans in aspects such as classroom teaching, after-class tutoring, homework assignment, and assessment evaluation. For students with weak foundations, focus on knowledge consolidation and method guidance, strengthen basic knowledge proficiency training; for average students, emphasize ability improvement and thinking expansion; for students with advantages, increase exploratory and innovative learning tasks to meet the needs of individualized development, and comprehensively improve the adaptability of classroom teaching and the overall quality of talent cultivation.

6. Conclusion

Digital transformation brings a historic opportunity for the innovation of university education management models. The data-driven precise governance mechanism, one-stop service platform, and digital profiling evaluation system support each other, forming an overall closed loop of decision-making–service–assessment. Universities should, based on their own actual conditions, gradually promote the construction of data infrastructure, the reorganization of business processes, and the improvement of teachers and students’ digital literacy, in order to achieve a modern governance model centered on students and driven by data.

Disclosure statement

The author declares no conflict of interest.

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