HiLL PUBLISHING

The Educational Review, USA, 2026, 10(7), 406-412
https://www.hillpublisher.com/Journals/er/
ISSN Online: 2575-7946
ISSN Print: 2575-7938

# Research on the Endogenous Dynamics of Data-Intelligence-Driven University Governance

**Qiusi Ni**

Development Planning Department, East China Normal University, Shanghai 200241, China.

**How to cite this paper:** Qiusi Ni. (2026). Research on the Endogenous Dynamics of Data-Intelligence-Driven University Governance. *The Educational Review, USA*, 10(7), 406-412.
DOI: 10.26855/er.2026.07.004

**Received:** May 12, 2026
**Accepted:** June 8, 2026
**Published:** July 6, 2026

**Corresponding author:** Qiusi Ni, Development Planning Department, East China Normal University, Shanghai 200241, China.

© 2026 by the author(s).
This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives (CC BY-NC-ND) license, which permits non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited and is not modified or adapted.
https://creativecommons.org/licenses/by-nc-nd/4.0/

## Abstract

In the midst of the global wave of digitalization in higher education, data-intelligence-driven university governance has become an important lever for modernizing university governance systems and governance capacity. Currently, in the process of promoting data-intelligence-driven university governance, Chinese universities still face problems and challenges such as incomplete basic databases, data silos, lack of data literacy among data decision-makers and users, ineffective application of generative artificial intelligence, poor data quality, and the absence of evaluation mechanisms for data-driven governance. To address these issues, the article further identifies the constituent elements of the endogenous dynamics in data-intelligence-driven university governance, and then deduces the generation mechanism and evolution path of these endogenous dynamics, thereby establishing a logical framework for data-intelligence-driven university governance. The effectiveness of the endogenous dynamics is evaluated from four dimensions—governance efficiency, decision quality, subject satisfaction, and innovative development—thereby proposing optimization paths and policy recommendations to stimulate and strengthen these endogenous dynamics.

## Keywords

Data-intelligence-driven; university governance; endogenous dynamics; evaluation system; optimization paths

At present, global higher education is amidst a wave of digital transformation, and the data-and intelligence-driven modernization of university governance has become a key lever for advancing the modernization of university governance systems and governance capacity. With the rapid development of new-generation information technologies such as big data, artificial intelligence, and blockchain, university governance models are confronted with unprecedented pressure for change and opportunities for innovation. In the context of the digital era, grounded in governance dilemmas and empowered by digital technologies, the digital transformation of university governance has acquired generative forces across three dimensions: intrinsic impetus, technological support, and value traction.

## 1. Current Research Status and Practical Dilemmas

### 1.1 Current Status of Domestic Research

Domestic research on data-intelligence-driven university governance began with the construction of "digital campuses" in the late 20th century, focusing on campus networks, teaching management systems, and office automation systems, initially achieving the informatization of teaching and management. With the gradual deepening of

educational informatization, and in recent years, driven by the implementation of the national education digitalization strategy, research in this field has shown vigorous development. In terms of research content, domestic studies mainly focus on the following aspects:

First, research on the value and significance of data-intelligence governance. Scholars generally believe that digital and intelligent technologies provide important opportunities for the modernization of university governance. Second, research on practical dilemmas of data-intelligence governance. Wang Xiaoqian points out that the digital transformation of university governance faces challenges such as the deviation between the instrumental rationality of digital technology and the value rationality of university governance, imperfect guarantee mechanisms for digital transformation, and security risks and compatibility issues arising from the embedding of digital technology into university governance processes (Wang, 2025). Third, research on pathways and strategies for data-intelligence governance. Shen Guochang and Zhou Xuan propose exploring the transformation paths of university digital governance from the dimensions of facilities, platforms, subjects, concepts, and mechanisms, focusing on improving the construction of new educational infrastructure, optimizing integrated big data smart platforms, building information management talent teams, and enhancing the digital literacy and "self-governance" awareness of teachers and students (Shen & Zhou, 2023). In addition, several studies mention using data dashboard visualization to assist universities in making governance decisions. Fourth, research on the behavioral intention influence mechanism of data-driven university management decision-making. This research confirms the effectiveness of data-driven university management decision-making and identifies the influencing factors of behavioral intention in data-driven university management decision-making. Fifth, research on evidence-based governance in universities in the context of data-driven approaches. Evidence-based governance in universities refers to the process in which, in the era of big data, governance subjects take evidence as the core, integrate subjective experience, research evidence, and stakeholder values to govern universities scientifically, precisely, collaboratively, and efficiently (Piao & Li, 2024). Evidence-based governance in universities still faces problems such as insufficient evidence-based literacy of governance actors, inadequate evidence development, and unsmooth evidence-based governance mechanisms. Among these problems, inadequate evidence development is the core issue. The key to solving this problem lies in establishing an evidence-based database, which can be achieved by "proposing scientific evidence needs, securing the sources of scientific evidence, and enhancing the intensity of evidence translation" (Qin & Qi, 2025). Sixth, research on the impact of generative artificial intelligence on university governance. In the context of educational digital transformation, generative artificial intelligence has begun to empower internal university governance, but it also brings various risks and dilemmas.

Although domestic research has achieved fruitful results, the following shortcomings still exist: First, existing studies mostly focus on technological application and institutional design, paying insufficient attention to the "endogenous dynamics" of data-intelligence governance in universities. Second, research methods are mainly based on macro-level discussions and case descriptions, lacking in-depth analysis of internal mechanisms and empirical testing. Finally, the research perspective is relatively narrow, with insufficient interdisciplinary integration, failing to fully absorb achievements from fields such as educational management and organizational behavior.

### 1.2 Current Status of International Research

International research on data-intelligence-driven university governance started earlier, with more diverse theoretical and practical explorations. In terms of research themes, it mainly focuses on the following aspects: First, research on the concepts and models of data-intelligence-driven governance. The digital governance practice of Arizona State University in the United States shows that university digital governance needs to build a digital governance system based on adaptive governance concepts, distributed governance structures, open governance procedures, and preventive governance norms (Chang & Hu, 2024). Western scholars generally emphasize a "student-centered" governance philosophy, focusing on the integration of data-intelligence technology with the essence of education. Second, research examines practical cases of data-intelligence-driven governance. The research focuses on the application of data-intelligence in education management processes (Cholyshkina et al., 2024), as well as in empowering teaching, learning, and assessment (Cope et al., 2021; Huang et al., 2021). Third, research on the ethical risks of data-intelligence-driven governance. International research generally focuses on ethical issues, data privacy, and algorithmic fairness in data-intelligence governance. Ethical principles in this field emphasize that such technologies must be used for benefit rather than harm, reflecting the principles of social justice and fairness, protecting

privacy, respecting human autonomy, and accepting public oversight. Fourth, research on leadership in the context of data-intelligence-driven governance. The era of artificial intelligence is changing educational management and leadership. Exploring the symbiotic roles of AI and educational leaders in administrative decision-making processes has attracted the research and reflection of some scholars. By analyzing the roles and functions of AI and educational leaders, it is proposed that AI should enhance rather than replace educational leadership (Dai, 2025). Fifth, research examines the dilemmas and countermeasures encountered in the transformation of universities into data-driven organizations. Scholars holding this view believe that data has a positive impact on university strategic planning and student capacity development, but at the same time, they must face the risks of data privacy and reduced human interaction (Abulibdeh & Ammar, 2025).

Compared with domestic research, international research places greater emphasis on empirical studies and critical reflection, focusing not only on the technical efficiency of data-intelligence governance but also on its implications for social equity and academic freedom. However, international research is largely based on Western institutional and cultural contexts, providing limited reference for the theory and practice of data-intelligence-driven university governance in the Chinese context.

### 1.3 Practical Dilemmas of Data-Intelligence-Driven University Governance

In the process of promoting the modernization of data-intelligence-driven university governance, Chinese universities still face many practical problems and challenges, which mainly focus on the following aspects: First, there is a lack of effective design in basic data collection. The significance of data collection has not been thoroughly considered from the perspective of data-intelligence-driven governance, resulting in insufficient collection density and unclear underlying logic, causing basic data to degenerate into ineffective numbers. Second, data application remains superficial, and the phenomenon of data silos is widespread. Due to inconsistent data statistical calibers and collection standards, a large amount of collected data resources has failed to form effective and shareable databases, instead becoming a huge data burden. Third, data decision-makers and users lack the professional technical literacy for data processing and do not understand the application of algorithms to data, while data technicians lack business background knowledge and do not understand the logical correlations among data, thereby affecting the scientific nature of constructing a data-intelligence governance system. Fourth, generative artificial intelligence has not been effectively applied in the process of data-intelligence-driven university governance, resulting in low efficiency of data-intelligence-driven governance. Fifth, poor data quality leads decision-makers to dare not use it and users to be unwilling to use it. Sixth, there is a lack of scientific evaluation mechanisms for the effectiveness of data-driven governance. These dilemmas ultimately stem from insufficient endogenous dynamics in university data-intelligence governance; that is, universities lack a sustained, systematic, and self-reinforcing driving force for data-intelligence governance. Therefore, exploring the endogenous dynamics of data-intelligence-driven university governance has both theoretical value and practical urgency.

## 2. A Logical Framework for Data-Intelligence-Driven University Governance

### 2.1 Constituent Elements and Structural Relationships of Endogenous Dynamics in Data-Intelligence-Driven University Governance

From a systemic perspective, the key constituent elements of endogenous dynamics in data-intelligence driven university governance include subject factors (decision-making level, digital literacy of faculty and students, and willingness to participate), technological factors (data quality, platform functionality, and security), object factors (application across various object scenarios such as talent cultivation, scientific research, faculty development, financial resources, and social impact), and evaluation factors (effectiveness evaluation). The intrinsic interconnections and interactions among these elements form the basis for constructing a four-dimensional “Subject-Technology-Object-Evaluation” model of endogenous dynamics in data-intelligence-driven university governance.

#### 2.1.1 Subject Factors: The “Source of Agency” of Endogenous Driving Forces

The decision-making level of the subjects includes the university’s top-level forward-looking capability for data-intelligence strategic planning, the data-based collaborative decision-making capability of middle-level management departments, and the agile response and execution capability at the faculty and departmental levels. The

decision-making level determines the direction, priorities, and resource allocation of the data-intelligence transformation. The digital literacy and willingness to participate of faculty and students serve as the "fuel" of the dynamic system. Digital literacy is not merely a skill but also encompasses data thinking, critical thinking, and ethical awareness; the willingness to participate stems from the recognition of the value of data-intelligence tools, perceived ease of use, as well as effective incentive and fault-tolerance mechanisms. The transformation of faculty and students from passive users to active co-constructors is the fundamental manifestation of endogeneity.

#### 2.1.2 Technological Factors: The "Enabling and Supporting Foundation" of Endogenous Dynamics

Data quality involves the accuracy, completeness, consistency, timeliness, and interoperability of data. High-quality, cross-domain integrated data warehouses (e.g., "data middle platform + business middle platform + AI middle platform") serve as the "lifeblood" of data-intelligence governance. They are not merely tools but also the "digital foundation" that carries new processes and new models. Security covers data security, privacy protection, system stability, and ethical compliance. A trustworthy and secure environment is a prerequisite for subjects to dare to use and be willing to use technology, acting as the "voltage stabilizer" for the sustained operation of the dynamics.

#### 2.1.3 Object Factors: The "Scope of Action and Value Anchors" of Endogenous Dynamics

Object factors are the core scenarios where data-intelligence governance generates actual value, and the ultimate areas where the dynamics are realized and manifested. In terms of talent cultivation, this is reflected in personalized learning path recommendations, early warning and precise intervention in learning, virtual simulation teaching, and comprehensive digital portraits of students. In terms of scientific research, it is reflected in big-data-based research topic discovery, interdisciplinary collaborative research platforms, research data management and sharing, and AI-assisted experimentation and simulation. In terms of faculty development, it is reflected in the assessment and development of teachers' digital teaching capabilities, precise teacher training, and digital career portfolios and performance evaluation.

#### 2.1.4 Evaluation Factors: The "Regulating and Evolutionary Engine" of Endogenous Dynamics

By constructing a multi-level, multi-dimensional value evaluation system that goes beyond simple "technology utilization rates," the evaluation results provide direct feedback to drive the optimization and adjustment of each element. Specifically, the system takes the endogenous dynamics of the subjects (decision-making level, digital literacy, participation willingness) as its starting point. Under the guidance of demand-driven and strategic leadership, and relying on technological support such as data quality, platform functionality, and security, it achieves process reengineering through empowerment and embedding. It generates value signals for objects such as talent cultivation, scientific research, faculty development, financial management, and social impact. Through effectiveness evaluation (efficiency, efficacy, innovation) and two-way feedback (adjusting strategies, enhancing literacy, iterating platforms, improving data), it drives a spiral ascent of "practice–evaluation–feedback," embodying the core logic of endogeneity, systemicity, and evolutionarity.

### 2.2 Generation Mechanism and Evolution Path of Endogenous Dynamics in Data-Intelligence Driven University Governance

To explore the generation mechanism and evolutionary laws of endogenous dynamics in university data-intelligence governance, efforts should be made from three aspects: subjects, objects, and the evaluation system. From the perspective of subjects: first, solving pain points and difficulties — how to break down departmental barriers through business process reengineering, build data middle platforms, unblock bottlenecks in business management, mitigate the risk of "shooting-from-the-hip" decision-making, and provide data support for scientific decision-making in resource competition; second, capacity building how to move from tool application to literacy cultivation, enhancing the digital awareness and capabilities of the subjects. From the perspective of objects: first, focusing on data empowerment, how to activate databases through data collection, analysis, and application; second, innovation-driven demonstration, how to guide data-intelligence governance through typical pilot projects and innovation cases. From the perspective of the evaluation system: integrating data-driven working methods and outcomes into the performance appraisal systems of departments and individuals. The interaction of the above aspects forms a self-reinforcing cycle of endogenous dynamics.

### 2.2.1 Subject-Driven: From "Pain Point Response" to "Capacity Building"

When pain points such as "departmental data silos leading to low management efficiency," "lengthy business approval processes," "repeated form filling," and "contradictory data results for the same indicator" accumulate to a critical point, the strong demand for problem-solving transforms into the initial driving force for change. Through business process reengineering and the construction of data middle platforms, bottlenecks are directly unblocked. The resulting immediate efficiency gains (e.g., "one-form handling") constitute the first round of positive feedback in the generation of dynamics, demonstrating the value of data-intelligence.

### 2.2.2 Object-Driven: The Manifestation of Value from "Data Empowerment" to "Innovation Demonstration"

The core material basis of endogenous dynamics is data. Through systematic, standardized data collection, governance, and analytical application, "data resources" are transformed into "data assets" that can be used for insight, decision-making, and optimization. By concentrating resources to create successful cases, the demonstrative effect of these cases can both reduce the hesitation and fear of other subjects and provide replicable, referable pathways, thereby driving incremental change across the entire object system from point to area.

### 2.2.3 Evaluation-Regulated: Leverage Reinforcement from "Soft Advocacy" to "Hard Constraint"

The outcomes of data-driven efforts (e.g., contribution to data quality, data-based decision-making cases, business process optimization results, etc.) are incorporated into departmental performance assessments as well as individual award evaluations, title promotions, and career advancement systems. The embedding of the evaluation system provides institutional guarantees and sustained incentives for the generation and maintenance of endogenous dynamics, compelling and guiding all subjects to take it seriously.

## 3. Effectiveness Evaluation and Empirical Testing of Endogenous Dynamics in Data-Intelligence Driven University Governance

The effectiveness evaluation system for endogenous dynamics in data-intelligence-driven university governance includes four dimensions: governance efficiency, decision quality, subject satisfaction, and innovative development. The governance efficiency dimension refers to the decision-making speed of subjects, the execution efficiency of various departments, and the utilization rate of campus resources, among others. The decision quality dimension points to the scientificity, accuracy, and foresight of subjects' decision-making. The subject satisfaction dimension encompasses the participation, sense of gain, and recognition of faculty and students. The innovative development dimension refers to the innovation outcomes and core competitiveness brought about by data-intelligence governance.

**Table 1. Data-Driven Endogenous Dynamics Effectiveness Evaluation Scale**

| Evaluation Dimensions | No. | Evaluation Indicators | Specific Description | Score (1-5) |
|---|---|---|---|---|
| A. Governance Efficiency Dimension | A1 | Decision-making speed | Shortened decision-making time | 1 2 3 4 5 |
| | A2 | Execution efficiency | Improved efficiency of cross-departmental collaboration | 1 2 3 4 5 |
| | A3 | Process simplification | Process simplification | 1 2 3 4 5 |
| | A4 | Resource utilization rate | More efficient resource utilization | 1 2 3 4 5 |
| | A5 | Collaborative office | Information sharing | 1 2 3 4 5 |
| B. Decision Quality Dimension | B1 | Data-supported decision-making | Decisions are based on data analysis | 1 2 3 4 5 |
| | B2 | Precision management | Accurately identify problems through data | 1 2 3 4 5 |
| | B3 | Proactive forecasting | Use data analysis to predict development trends | 1 2 3 4 5 |
| | B4 | Decision transparency | The decision-making process is transparent | 1 2 3 4 5 |
| | B5 | Dynamic adjustment mechanism | Adjust decisions based on data | 1 2 3 4 5 |

**Table 1 Continued**

| Evaluation Dimensions | No. | Evaluation Indicators | Specific Description | Score (1-5) |
|---|---|---|---|---|
| C. Subject Satisfaction Dimension | C1 | Convenience of participation | Participate in governance through data platforms | 1 2 3 4 5 |
| | C2 | User experience | Easy to operate and responsive | 1 2 3 4 5 |
| | C3 | Sense of gain | Improved work efficiency | 1 2 3 4 5 |
| | C4 | Sense of recognition | Recognize the value of digital-intelligent construction | 1 2 3 4 5 |
| | C5 | Training support | Usage training and skill support | 1 2 3 4 5 |
| | C6 | Feedback responsiveness | Problems are responded to and handled in a timely manner | 1 2 3 4 5 |
| D. Innovative Development Dimension | D1 | Innovation output | New teaching models, management methods, or research achievements | 1 2 3 4 5 |
| | D2 | Adaptability to change | Rapidly respond to changes in the external environment | 1 2 3 4 5 |
| | D3 | Core competitiveness | Enhance the university's competitiveness | 1 2 3 4 5 |
| | D4 | Continuous improvement | Continuous self-assessment and improvement mechanism | 1 2 3 4 5 |
| | D5 | Social impact | Positive social demonstration | 1 2 3 4 5 |

## 4. Optimization Paths and Policy Recommendations for Data-Intelligence Driven Endogenous Dynamics

In summary, the optimization paths and policy recommendations for stimulating and strengthening the endogenous dynamics of data-intelligence-driven university governance can be pursued from the following aspects.

### 4.1 Data Collection: From "Passive Collection" to "Active Governance"

Change the current situation of blind data collection. Conduct top-level design before collection, clarifying the significance and application scenarios (underlying logic) of each type of data within the governance model. Through technologies such as the Internet of Things (IoT) and APIs, increase the automatic collection density of key business data (e.g., teaching and research processes), transforming data from static, lagging "numbers" into dynamic, forward-looking "assets."

### 4.2 Data Integration: From "Data Silos" to "Data Middle Platform"

Study the most fundamental atomic data indicators, standardize data specifications and calibers, and break down departmental data barriers. Technologically, build a data middle platform to clean, integrate, and model heterogeneous data, forming high-quality, reusable databases. This fundamentally converts the "data burden" into "data fuel" that supports innovation.

### 4.3 Capacity Building: From "Mutual Isolation" to "Integrated Symbiosis"

Form cross-functional teams composed of business experts (decision-makers, managers) and data technicians, and conduct two-way training: provide data literacy education for decision-makers so they "understand data," and offer business knowledge training for technicians so they "understand education." This cultivates interdisciplinary talents who understand both business and data.

### 4.4 Technology Empowerment: From "Traditional BI" to "Intelligent AI"

Actively explore the application of intelligent technologies such as generative AI in governance scenarios. For example, use them for intelligent form filling, policy Q&A, course content generation, academic data analysis, and trend forecasting. This frees human resources from inefficient labor and enables a leap from descriptive analysis (what happened) to predictive and prescriptive analysis (what will happen and what should be done).

### 4.5 Data Quality: From "Vicious Cycle" to "Virtuous Closed Loop"

Establish a closed-loop data quality management mechanism of "collection-cleaning-application-feedback-optimization," clarifying the responsibilities of data source departments. Create several demonstration projects of high-quality data application so that decision-makers "dare to use" and users "are willing to use" the data. Promote construction through usage, forming a virtuous cycle of continuous data quality improvement.

### 4.6 Evaluation Mechanism: From "Construction-Oriented" to "Effectiveness-Oriented"

Establish a scientific evaluation system focusing on key indicators of data-driven effectiveness, such as the call rate of data interfaces, the number and outcomes of data-supported decision-making cases, and the satisfaction of faculty and students with data services. Ensure that data governance work genuinely serves the core mission and strategic goals of the university.

## References

Abulibdeh, S., & Ammar, K. (2025). A scoping review of the strategic integration of artificial intelligence in higher education: Transforming university excellence themes and strategic planning in the digital era. *Journal Name*, *60*.

Chang, Q., & Hu, D. (2024). Transformation and reshaping: The practical path and implications of digital governance in American universities—Based on the example of Arizona State University. *Foreign Education Research*, *3*, 63-74.

Cholyshkina, O., Onyshchenko, A., Kudin, V., Gladka, M., & Oleksiienko, S. (2024). The use of artificial intelligence in optimising education management processes. *Innovation and Transformation of Educational Systems*, 33-47.

Cope, B., Kalantzis, M., Searsmith, D., & Duane, D. (2021). Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. *Educational Philosophy and Theory*, *53*, 1229-1245.

Dai, R. (2025). The roles of AI and educational leaders in AI-assisted administrative decision-making: A proposed framework for symbiotic collaboration. *Australian Educational Research*, *4*, 1471-1487.

Huang, J., Saleh, S., & Liu, Y. (2021). A review on artificial intelligence in education. *Academic Journal of Interdisciplinary Studies*, *3*, 206.

Piao, X., & Li, H. (2024). The value implication, realistic dilemmas and breakthrough paths of evidence-based governance in universities. *Modern Education Management*, *2*, 43.

Qin, W., & Qi, Z. (2025). Evidence-based governance: The rational transition of higher education governance models. *Theory and Practice of Education*, *27*, 3-9.

Shen, G., & Zhou, X. (2023). The motivation, connotation and path of digital empowerment for the modernization of university internal governance. *Modern Education Management*, *10*, 62-71.

Wang, X. (2025). Digital transformation of university governance: Generation logic, realistic challenges and path selection. *National Research Network*.