

From Data Governance to Faculty Engagement: A Conceptual Model for Higher Education

Jian Shen^{1*}, Norris Syed Abdullah² and Zheng Fu³

^{1*,2}Faculty of Management, Universiti Teknologi Malaysia UTM Skudai, 81310 Johor Bahru, Johor, Malaysia, ³Azman Hashim International Business School, Universiti Teknologi Malaysia, Kuala Lumpur, 54100, Malaysia

^{1*}Corresponding Authors Email: shenjian@graduate.utm.my

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Abstract

This study proposes a conceptual model to examine how data governance practices influence faculty engagement with data in Chinese higher education institutions. Existing research tends to emphasize top-down policy structures while overlooking the behavioral and perceptual dimensions of data usage. To address this gap, the proposed model integrates governance-related constructs (e.g., data culture, quality, literacy, and security) with user perceptions (e.g., trust, perceived usefulness, and psychological safety). The model was constructed based on thematic patterns emerging from 135 peer-reviewed studies identified through a prior systematic review. It draws upon established behavioral theories such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology–Organization–Environment (TOE) framework. Data participation is conceptualized as a dynamic process involving data entry, feedback, sharing, and co-construction of governance mechanisms. The model also emphasizes the bidirectional relationship between user behaviors and institutional governance structures. This framework offers a theoretical foundation for future empirical research and practical guidance for developing inclusive, behaviorally informed data governance strategies in higher education

Keywords: Data Governance, Behavioral Pathway, Higher Education, Faculty Engagement, Conceptual Model

Introduction

In the era of digital transformation, data governance has become a critical component of institutional management in higher education. Universities around the world are increasingly expected to manage data not only for compliance and accountability but also to inform teaching, research, and administrative decision-making (Ifenthaler & Schumacher, 2016; OECD, 2021). As learning management systems (LMSs) and analytics platforms become more prevalent, the effectiveness of data governance is no longer determined solely by technical

systems or top-down policies, but also by how end-users particularly faculty engage with and respond to data-related initiatives (Cheong & Nyaupane, 2022).

However, in the context of Chinese higher education institutions (HEIs), current data governance practices remain predominantly structural and centralized. Despite national policies promoting smart campuses and educational informatization, many universities continue to emphasize top-level design and ignore user-centered mechanisms (Jiang Chengfei, 2022; Hu et al, 2023). This gap is particularly evident in the underexplored relationship between governance structures and faculty data engagement.

Prior research emphasizes frameworks and maturity models such as DAMA, DCMM, or similar, which evaluate governance from a technical or managerial perspective (Zhang & Liu, 2022). While these studies provide valuable structural insights, they rarely address behavioral dimensions such as trust, perceived usefulness, or psychological safety—factors that significantly influence whether governance translates into actual data use. For example, recent work underscores the need to integrate technological, ethical, educational, and social-structural lenses in data governance (Hillman, 2023), suggesting that user agency and perception are essential components.

To bridge this gap, this study proposes a conceptual model that links institutional governance practices to behavioral engagement through mediating factors such as data culture, quality, security, and literacy. It aims to develop a user-centered framework for understanding how governance affects data usage behaviors among faculty in Chinese universities and to lay the foundation for future empirical research.

Research Gaps and Challenges in the Literature

Lack of Consideration for Data Users in Governance Frameworks

The primary goal of data governance is to address challenges related to data quality, security, and sharing. However, in Chinese universities, governance frameworks and policies are predominantly developed top-down, with limited emphasis on the perspectives and needs of actual data users (Cheng Bei et al., 2020; Jiang Chengfei, 2022; Hu Shuixing et al., 2023).

Although governance implementation has revealed numerous challenges, research discussions continue to focus on macro-level governance structures, without adequately exploring how to reduce barriers for data users and enhance their experience in data applications. For example, scholars have pointed out that top-down data governance policies often become rigid during implementation, making them poorly suited for complex governance needs (Gao Dandan, 2024). Additionally, unclear responsibilities among governing bodies frequently result in interdepartmental coordination difficulties (Zhang Guixiang et al., 2022).

Several studies have used frameworks such as DCMM (Data Management Capability Maturity Model) and DAMA (Data Management Body of Knowledge) to evaluate the maturity of data governance in Chinese universities. However, these studies primarily focus on technical and managerial aspects, neglecting the perspectives and demands of different stakeholders in the governance process.

Furthermore, data users (e.g., faculty, administrators) are often excluded from governance policy development, limiting their engagement in data-driven decision-making (Zhang Guixiang et al., 2022). In some cases, this lack of participation leads to skepticism about governance policies or inconsistencies in implementation (Liu Jinsong, 2018). As a result, data governance measures fail to improve actual data usage rates and, in some cases, even exacerbate data silos within universities, further obstructing data-driven decision-making.

Overemphasis on Governance Frameworks While Neglecting the Impact on Data Usage

Research on data governance in Chinese universities has primarily focused on governance frameworks and top-level policy design, with limited attention to the actual effects of governance on data usage behaviors. While governance aims to lower barriers to data usage and improve data quality, most studies remain normative and conceptual, with few empirical assessments of governance effectiveness.

Some scholars have started investigating this issue. For example, Dong Xiaohui et al. (2023) conducted grounded theory research through faculty interviews to identify key factors influencing data usage in teaching and administration. Other studies (Zhang Xiangyi, 2021; Song Lingchao, 2024; Jiang Chengfei, 2022; Zhou Wei, 2021) have examined how data security awareness and data-sharing mechanisms impact faculty data usage behaviors.

However, existing research lacks in-depth analyses of the mechanisms through which data governance influences data usage behaviors. Moreover, China's unique data culture and its impact on data-driven decision-making remain underexplored. Data culture refers to the institutionalized values, norms, and practices that promote the meaningful use of data within an organization (Powers & Henderson, 2018). Current governance policies have yet to foster a true data-driven decision-making culture, and the reasons behind this require further investigation.

Insufficient Quantitative Research on University Data Governance in China

Compared to Western universities, quantitative research on data governance in Chinese universities remains limited, particularly in terms of correlation analyses between governance elements (He Yi & Si Li, 2024).

Most empirical studies on Chinese university data governance rely on qualitative methods, such as structured interviews, case studies, and content analysis (Liu Guifeng et al., 2022; Li Mengxin, 2024). Even when quantitative studies are conducted, they are often limited to descriptive statistics or classification of key governance elements (Dong Xiaohui et al., 2023; Zhang Junchao et al., 2020; Wang Shouzhong et al., 2024). These studies lack robust theoretical models and seldom explore causal relationships between governance variables, making it difficult to derive practical policy recommendations.

Recently, some scholars have adopted structural equation modeling (SEM) to analyze latent variables in data governance (Hu Shuixing et al., 2022, 2024; Fang Dandan et al., 2024). However, these studies primarily focus on university-wide governance structures, with little emphasis on the impact of governance on individual data users (e.g., faculty, administrators).

Additionally, most SEM studies rely on cross-sectional data, lacking longitudinal studies that track governance impacts over time.

In contrast, Western universities have integrated quantitative methods into data governance research much earlier. Methods such as regression analysis, causal inference, and the Technology-Organization-Environment (TOE) framework have been widely used. For example, Hmoud et al. (2023) applied the TOE framework with PLS-SEM to analyze the key factors influencing business intelligence (BI) adoption in universities. Their study found that information culture, executive support, relative advantage, and data quality positively influenced BI adoption, while technological complexity was a significant barrier. Such research not only provides empirical insights but also offers practical recommendations for universities. However, Chinese universities have yet to establish a mature evaluation and feedback system for data governance, limiting the scientific refinement of governance policies.

Model Construction Approach

The proposed conceptual model is grounded in a thematic synthesis of 135 peer-reviewed studies included in a prior systematic literature review, which examined data governance practices and faculty data engagement in Chinese higher education institutions. Following the procedures of Thomas and Harden (2008), thematic synthesis involved three steps: (1) extracting relevant constructs and governance variables from empirical and conceptual studies, (2) clustering them into higher-order themes such as data culture, literacy, quality, and security, and (3) integrating these themes into a behavioral pathway that links governance practices, user perception, and faculty engagement behaviors.

In particular, theoretical lenses such as the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Technology–Organization–Environment (TOE) framework were consulted to ensure conceptual consistency and cross-contextual relevance. The model does not rely on new primary data but synthesizes existing knowledge into a testable framework, suitable for future empirical validation.

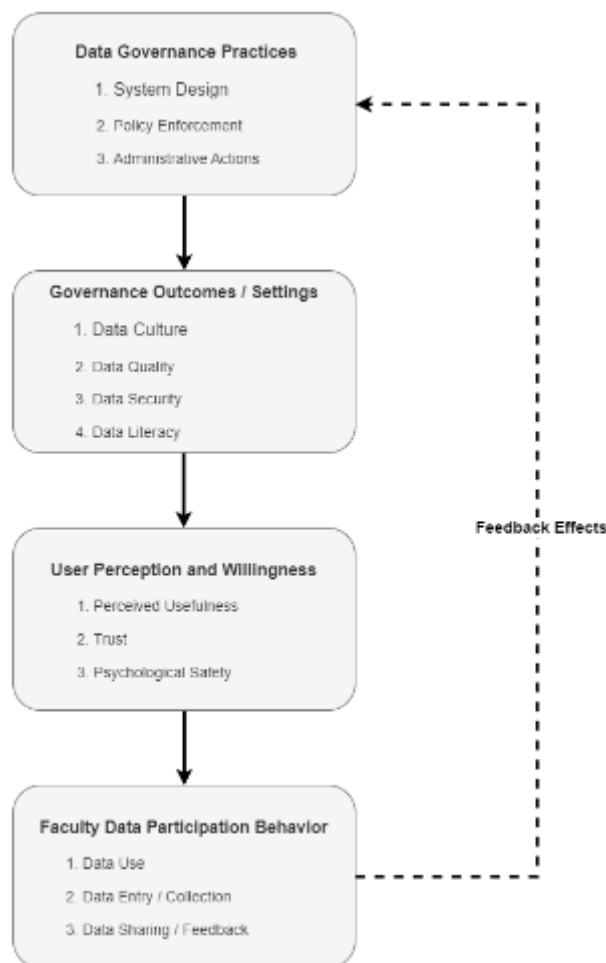


Figure 1. Behavioural Pathway of Data Governance Impact (Self-designed)

A Conceptual Model Linking Governance and Data Participation

Although there has been growing attention to data governance in Chinese higher education, existing literature remains largely focused on institutional structures, technological infrastructures, and policy frameworks (Jiang, 2022; Yuan, 2022). Research on how governance practices influence faculty members' data-related behaviors through behavioral pathways remains relatively limited. This gap makes it difficult to explain why some governance initiatives effectively promote participation while others do not and also highlight the lack of user-centered perspectives in evaluating governance outcomes.

To address this issue, this study proposes a conceptual behavioral pathway model, as illustrated in Figure 1. The model posits that institutional-level data governance practices—including system design, policy enforcement, and administrative actions—affect four key contextual variables: data culture, data quality, data security, and data literacy. These variables further shape faculty members' subjective perceptions of the data environment, including their trust in the system, perceived usefulness, and sense of psychological safety. Figure 9 visualizes this chain of influence and emphasizes the potentially observable and testable linkages between governance design and behavioral outcomes.

The model conceptualizes data participation as a multidimensional and dynamic process. It extends beyond data system usage to include activities such as data entry,

feedback, sharing, and even participation in governance design and evaluation. By framing faculty not merely as passive recipients but as active co-constructors of governance, the model emphasizes user agency in shaping governance effectiveness

This behavioral pathway has been partially reflected in existing studies. For example, Cheong and Nyaupane (2022), through group interviews, found that concerns over data security significantly hindered student engagement with institutional platforms. Beerkens (2022) identified leadership support and technological infrastructure as key governance-related factors influencing data use. Hillman (2023), using interviews and textual analysis, explored how governance policies are perceived and responded to by faculty. Hmoud et al. (2023), drawing on the Technology–Organization–Environment (TOE) framework, examined how factors such as cultural fit, top-level support, and third-party data vendor risks influence data-related decision-making. Collectively, these studies provide preliminary evidence of the influence of governance variables on user perception and behavioral intention.

In the Chinese context, several scholars have examined the influence of data quality, literacy, and security on faculty data practices (e.g., Qiu, 2019; Han et al., 2019). Wang (2024), adopting a collective action perspective, emphasized the need for governance to respond to users' behavioral demands and experiential concerns. While these studies have laid a valuable foundation for incorporating user perspectives, most remain at the level of conceptual discussion or problem identification. They have yet to develop systematic models that connect governance practices, user behaviors, and governance feedback. More recently, empirical efforts such as Hu et al. (2023) have begun to explore the relationship between governance practices and faculty perceptions using structural equation modeling, signaling a shift from conceptual inquiry toward mechanism-building. However, these models often focus on the one-way impact of governance on satisfaction-related outcomes and rarely examine how user behaviors feedback into governance improvement. A closed-loop model integrating governance, perception, and participation remains largely absent.

To address this theoretical gap, the model proposed in this study incorporates a dynamic, bidirectional pathway that links governance practices, contextual variables, user perceptions, behavioral participation, and governance feedback. It aims to offer a structured analytical framework for future empirical research while also providing theoretical support for improving data governance practices in higher education management.

Furthermore, this model lays a theoretical foundation for testing how specific governance factors influence faculty behavior through mediating or moderating effects of user perception variables. By connecting the structural and behavioral dimensions of data governance, the model offers a new lens for understanding and enhancing faculty engagement in data-informed decision-making.

Cross-Contextual Reflection on the Proposed Model

While the conceptual model proposed in this review is grounded in the specific policy and organizational context of Chinese higher education, its underlying logic—linking institutional governance practices to user perception and behavioral participation—bears broader analytical relevance. This section discusses the potential applicability and adaptability of the

model in other higher education systems and identifies key factors that may affect its transferability.

First, the model emphasizes the mediating role of contextual variables such as data culture, data literacy, and perceived data security—factors that are not unique to China. These dimensions have been recognized in international studies as central to user engagement with institutional data systems (e.g., Tsai et al., 2020; Ifenthaler & Schumacher, 2016). For instance, research in both Western and developing contexts shows that low trust in data infrastructure or insufficient technical preparation often impedes effective data use. Thus, while the institutional settings differ, the behavioral mechanisms may be comparable.

Second, what distinguishes the Chinese context is the strong top-down policy environment, which enables rapid institutional change but often lacks stakeholder participation. In contrast, universities in other regions may operate under more decentralized governance, where bottom-up dynamics and consensus-building play a greater role. The proposed model's flexibility lies in its capacity to accommodate both types of systems by emphasizing the importance of governance feedback loops and user co-construction.

Third, the model's bidirectional structure—whereby governance not only influences user behavior but is also shaped by it—offers a useful lens for interpreting governance challenges in various policy systems. For example, in settings where faculty resistance to data systems is high, understanding the perception-behavior-governance feedback loop can inform targeted interventions to foster engagement and trust.

In sum, while the proposed model reflects the realities of Chinese universities, its core mechanisms resonate with global challenges in educational data governance. It provides a conceptual basis for future empirical studies across different institutional contexts, particularly those facing the dual pressures of digital transformation and stakeholder skepticism.

To visually reflect the analytical structure and conceptual progression of this review, Figure 2 illustrates the transition from localized governance challenges in Chinese higher education institutions, through comparative reflections with international literature, toward broader theoretical and practical implications for global research. This three-stage trajectory also mirrors the review's chapter structure and serves as a roadmap for understanding how local empirical insights can contribute to the global discourse on educational data governance.

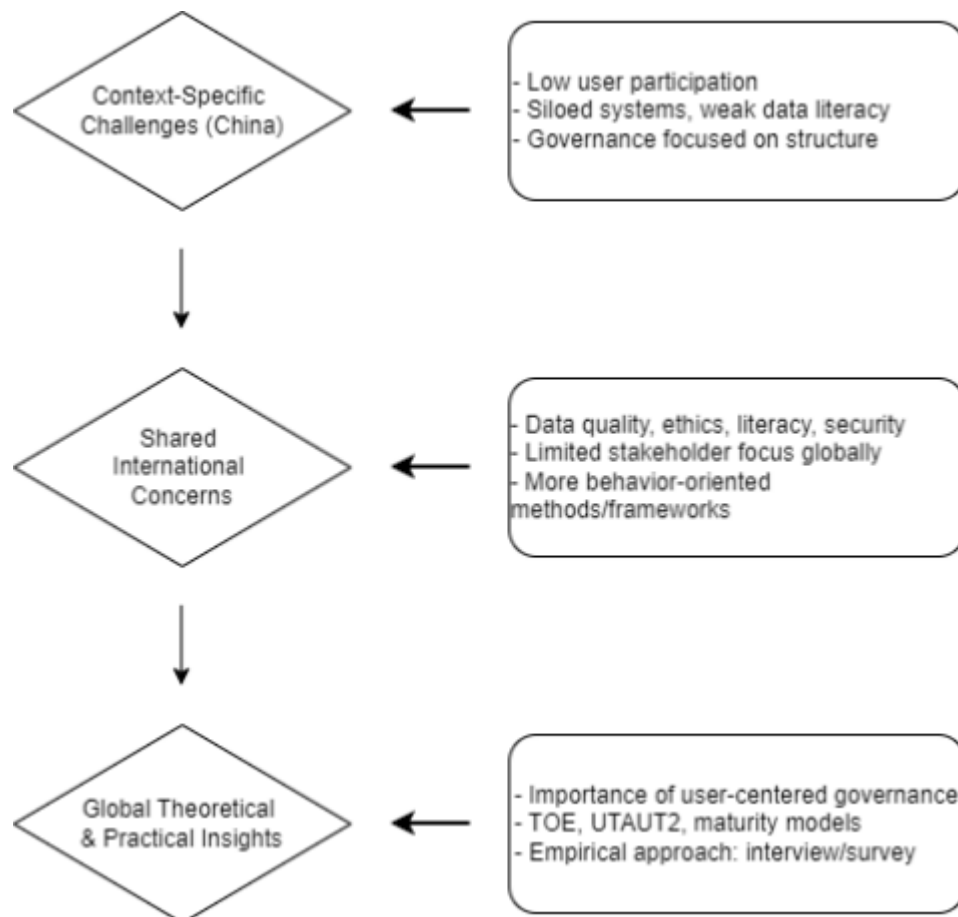


Figure 2. A Conceptual Transition from Local Challenges to Global Insights in Data Governance Research (Self-designed)

Future Research Directions

To build on the conceptual model proposed in this study, future research should prioritize three key dimensions: what to study, how to study, and who to study. These directions aim to advance empirical understanding of data governance and contribute to the development of more behaviorally informed frameworks.

First, future research should go beyond existing emphases on policy implementation and technical systems to explore under-investigated themes such as data culture, stakeholder participation, behavioral mechanisms, governance effectiveness, and interdepartmental collaboration. These dimensions are central to understanding data governance as a dynamic and negotiated process within institutional contexts.

Second, methodological diversification is essential. Although qualitative approaches offer valuable contextual insights, the field remains constrained by limited empirical testing. Future research should adopt mixed-method and longitudinal designs to examine how governance structures shape user perceptions and engagement over time. The use of established behavioral models—such as TAM, UTAUT, or TOE—could help operationalize key constructs like system trust, perceived usefulness, or psychological safety, providing more rigorous causal analysis.

Third, stakeholder diversity must be addressed. Existing studies often focus on faculty members, while overlooking the roles of students, institutional leaders, and IT or data service staff. Comparative studies across stakeholder groups and institution types can provide a more comprehensive view of how governance mechanisms are experienced and interpreted in different contexts.

In addition, innovative governance practices—such as regulatory sandboxes, participatory committees, and adaptive feedback mechanisms—should be systematically examined to assess their effects on user behavior and institutional outcomes. These practices may hold potential for developing more inclusive, responsive, and sustainable governance models.

Collectively, these directions offer a foundation for refining and empirically validating the conceptual framework introduced in this paper. By aligning future studies with these priorities, researchers can contribute to the creation of robust, scalable, and stakeholder-oriented data governance systems in higher education.

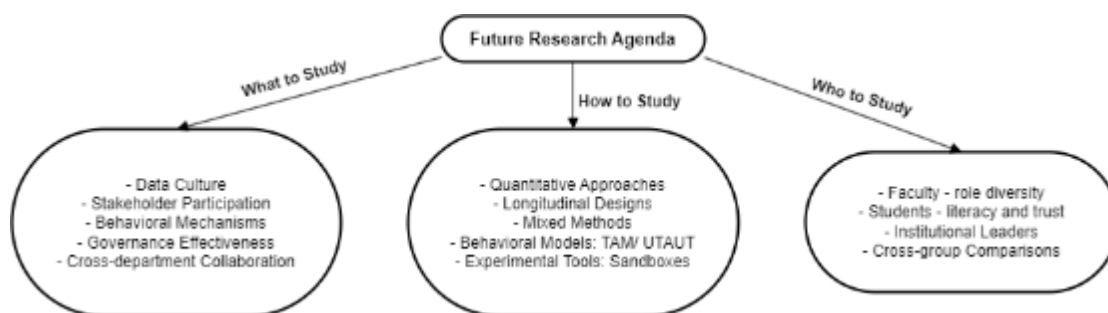


Figure 3. Framework for Future Research

To synthesize these priorities, **Figure 3** presents an integrated framework for guiding future research. It outlines a strategic agenda for building more inclusive, empirically grounded, and behaviorally informed models of data governance in HEIs.

Conclusion

This study proposes a conceptual model that links institutional data governance structures to faculty data engagement behaviors through a set of mediating contextual and perceptual variables. Building on the findings of a prior systematic literature review, the model addresses a critical gap in existing research—namely, the underrepresentation of stakeholder behavior and perception in the design and evaluation of data governance in Chinese higher education institutions.

The proposed behavioral pathway framework integrates structural dimensions such as data quality, security, culture, and literacy with user-centered variables including system trust, perceived usefulness, and psychological safety. It conceptualizes data participation not only as system usage but also as active contribution to data sharing, feedback, and governance co-construction. This model offers a more dynamic, responsive, and inclusive understanding of data governance by emphasizing bidirectional influence and feedback loops between institutional structures and individual users.

The model also demonstrates theoretical adaptability across different governance contexts. While grounded in the Chinese case, its core mechanisms resonate with global challenges in aligning top-down digital strategies with bottom-up user engagement. The framework is flexible enough to accommodate both centralized and decentralized governance environments, making it suitable for comparative research across higher education systems.

Practically, the model provides actionable insights for university leaders, IT governance teams, and policymakers. Promoting trust, enhancing system usability, and supporting faculty agency are critical for translating governance frameworks into meaningful data-driven practices. By shifting attention toward behaviorally grounded models and participatory design, institutions can strengthen the legitimacy and sustainability of their data governance efforts.

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