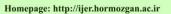




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Validation of an Intelligence Based Academic Governance Model in Comprehensive **Universities of Tehran**

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Article Info	ABSTRACT				
Article type:	Objective: This study aimed to design an intelligence-based academic governance model for				
Research Article	Iran's higher education system by identifying its key components and examining their causal				
Article history:	relationships.				
Received 21 May. 2025	Methods : The research employed an applied, descriptive-correlational design. Structural				
Received in revised form 07	equation modeling (SEM) using LISREL software was used to assess causal pathways among				
Aug. 2025	the variables. The statistical population included faculty members from public universities in Tehran in 2025. Data were gathered through a researcher-made questionnaire administered				
Accepted 11 Aug. 2025	via stratified random sampling.				
Published online 01 Dec. 2025					
1 uonomea omme o 1 2 co. 2020	intelligence-based academic governance had positive and significant effects on five				
Keywords:	dimensions: causal, contextual, intervening, strategic, and consequential factors. Path				
Academic governance,	coefficients ranged from 0.68 to 0.83, with corresponding t-values greater than 1.96. The				
Organizational intelligence,	strongest effect was observed for the strategic dimension (β = 0.83, t = 11.86, p < 0.001),				
Smart university,	underscoring the central role of intelligence in guiding macro-level decisions and supporting				
Structural equation modeling,	forward-looking planning in higher education.				
Higher education in Iran	on in Iran Conclusions: Achieving intelligent academic governance requires enhancing components				
	such as institutional and academic autonomy, rule of law and transparency, stakeholder				
	participation, intelligent management, knowledge governance, and universities' social				
	responsibility. The findings confirm that integrating intelligence into governance processes				
	can significantly improve decision-making capacity and accountability, offering a				
	technology-driven and participatory governance model for Iranian universities.				
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Introduction

Rapid global transformations in the fields of information technology, communications, and artificial intelligence have fundamentally reshaped the landscape of governance and management within educational systems. In such a context, universities—as authoritative institutions for knowledge production and the training of specialized human capital—require a deeper rethinking of their governance models and decision-making mechanisms. The concept of governance, which gained wide prominence in management and political science literature during the 1990s, refers to the mechanisms of coordination and interaction among institutions, social groups, and various stakeholders within the processes of policy formulation and implementation (Alas et al., 2010; Kazemian et al., 2019). Governance, therefore, is not merely equivalent to executive management; rather, it encompasses the distribution of power, accountability structures, transparency, and the informed participation of stakeholders in decision-making.

In the higher education system, governance is discussed more specifically under the notion of university or academic governance. This form of governance constitutes a set of processes, policies, and reciprocal relationships among the government, faculty members, university administrators, students, and civil society—relationships through which the university's mission, scientific orientation, research strategies, and resource allocation processes are defined (Edwards, 2004; Trakman, 2008). Today, structural changes, increased academic competition among universities, higher education globalization, and societal pressures for accountability have rendered traditional and bureaucratic university management models ineffective, highlighting the necessity of transitioning toward more participatory, flexible, and responsive governance models (Fathollahi et al., 2014).

Accordingly, academic governance, as one of the principal pillars of the modern higher education system, emphasizes a balance between institutional autonomy and universities' social accountability. Effective academic governance must not only preserve academic freedom and research dynamism, but also strengthen public trust and the social legitimacy of the university through transparent mechanisms. From this perspective, academic governance is not limited to managerial structures; it is a culture of scientific decision-making rooted in collective wisdom and mutual trust within the academic system (Jaramillo, 2012; Rabanikhah et al., 2023). When implemented properly, such governance fosters synergy among academic community members,

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improves educational quality, enhances resource efficiency, and promotes sustainable scientific development.

Smart governance concerns the relationships among private, governmental, economic, and social stakeholders and centers on citizen participation (Lopez & Oliveira, 2017). This style of governance is grounded in a transparent management system that allows citizens to participate in planning and decision-making processes regarding the development of their communities, while ensuring open access to information (Penasca & Velas, 2019). Smart governance employs information and communication technologies to improve democratic processes and public services (e-government), supporting and facilitating planning and decision-making (Camero & Alba, 2019).

Four key domains underpin smart governance: stakeholder engagement, systemic macro-level thinking, accountability, social responsibility, and evaluation and monitoring (Pourazzat et al., 2024). Smart governance represents a management approach shaped by the intelligent participation of citizens through ICT platforms, transforming citizens from passive recipients of urban services into active agents capable of expressing their needs regarding the types of services they require (Mohammadi Deh Cheshmeh & Moradi, 2021).

In the context of higher education, smart governance can facilitate the emergence of data-driven, network-based, and innovation-oriented universities, where decisions are not made through bureaucratic hierarchies but are instead informed by real-time data and intelligent analytics (Jimenez, 2013). Globally, many universities—particularly since the 2010s—have sought to smarten their management systems, performance evaluation mechanisms, human-resource management, and educational decision-making processes in order to enhance efficiency, transparency, and accountability. Leading universities in Europe and East Asia, for example, have adopted big data and machine learning solutions to continuously monitor teaching quality, research performance, and student satisfaction (Lee & Kim, 2021; Ahmed et al., 2023). These approaches have revolutionized academic governance and pushed higher education systems toward greater flexibility, dynamism, and transparency.

However, in Iran, the governance structure of higher education faces serious challenges. Administrative centralization, heavy dependence on governmental policies, the absence of integrated information systems, and weaknesses in performance transparency are among the major

obstacles to achieving smart governance. The division of responsibilities among the Ministry of Science, the Ministry of Health, and the Ministry of Education has resulted in institutional fragmentation and the absence of a unified strategy for managing universities. Additionally, the weak culture of accountability and organizational resistance to change have hindered the institutionalization of good governance in the country's higher education system (Shahpouri & Kalantari, 2016). These issues underscore the urgency of developing indigenous and intelligence-based governance models that align with Iran's cultural and organizational context and harness modern technologies to promote accountability and transparency.

Within this framework, the present study, entitled "Developing and Validating a Smart Academic Governance Model for Comprehensive Universities in Tehran", seeks to identify the dimensions, components, and indicators of a localized academic governance model that incorporates elements of smartness into the university decision-making structure. The aim is to propose a model that leverages data-driven technologies to enhance decision-making quality, increase stakeholder participation, strengthen institutional autonomy, improve transparency in administrative processes, and reduce bureaucratic redundancy. Comprehensive universities in Tehran, given their size, diverse missions, and extensive social interactions, constitute an appropriate context for examining academic governance in Iran; thus, their selection in this study is theoretically and practically justified.

Although some research has addressed governance, far fewer studies have investigated governance within the academic and smart-governance domains. Qeiravani, Montazeri, and Zahedi (2023) found that human-resource development and training play a vital role in realizing smart governance, with components such as smart cost management, smart accountability, and organizational efficiency forming the core indicators of their final model. Shakib et al. (2022) showed that good governance in Iranian public universities—emphasizing participation, accountability, and transparency—can enhance trust between faculty members and administrators and play a significant role in improving scientific decision-making. Ebrahimi and Abdollahi (2022) concluded that implementing smart governance in higher education requires developing data-driven infrastructures and intelligent decision-support systems, with the lack of integrated information systems being the main barrier. Razavi and Karami (2021) found that evaluating universities based on academic governance indicators is positively associated with scientific

effectiveness and research innovation, recommending that quality-assessment systems be redesigned through network-based governance principles. Zhou and Li (2022) reported that the use of data-driven technologies and artificial intelligence in academic decision-making increased transparency, accountability, and trust between administrators and faculty members in China's higher education governance system. Tasten and Davoudi (2021) noted that academic governance becomes effective when universities move away from bureaucratic structures and, by relying on information intelligence, increase decision-making agility and self-management capacity within academic units. Kauko and Wiborg (2020) found that constructive interaction among policymakers, university managers, and faculty is central to the success of European academic governance models, significantly enhancing organizational learning and academic innovation. Finally, De Boer and Maassen (2020) concluded that greater academic and financial autonomy is directly associated with improved research performance, and that European academic governance models rest on maintaining a balance between the roles of the government and the faculty.

Overall, the present study seeks to provide a conceptual and practical response to one of the fundamental gaps in Iran's higher education system: the absence of operational models for academic governance in the digital age. Achieving such a model could foster coherence in university decision-making, improve human and financial resource efficiency, enhance institutional accountability, and ultimately contribute to sustainable scientific development in the country. Thus, exploring smart academic governance is not only a theoretical necessity but also an operational imperative for the future of Iran's higher education, with the potential to shape scientific policymaking in the decades ahead. Accordingly, the objective of this research is to propose and validate a smart academic governance model for comprehensive universities in Tehran.

Material and Methods

The present study employed an applied research design with a quantitative approach and a descriptive—survey method conducted cross-sectionally. The statistical population consisted of 2,850 faculty members in the fields of management, higher education management, educational management, and governance-related faculties across three comprehensive universities in Tehran (University of Tehran, Shahid Beheshti University, and Islamic Azad University—Science and

Research Branch). Based on Krejcie and Morgan's sampling table, a sample size of 338 was deemed appropriate; with an additional 10% added to compensate for potential attrition, the final sample size reached 357 participants. Stratified random sampling was used according to university and academic discipline, with proportional shares of 139, 104, and 114 participants, respectively. The data collection instrument was a researcher-developed questionnaire comprising 121 items across 22 components, measured using a seven-point Likert scale (ranging from "strongly disagree" to "strongly agree"). The questionnaire's validity was assessed through face and content validity. For content validity, the Content Validity Ratio (CVR) was calculated using Lawshe's formula, with a minimum acceptable threshold of 0.42; all components exceeded this threshold—for example, the "smart administrative management" component yielded a CVR of 0.93. Reliability was examined using Cronbach's alpha, with all components achieving coefficients above 0.70 (e.g., rule-based governance = 0.845; technological factors = 0.910).

Descriptive analyses were conducted using SPSS, and data normality was evaluated through the Kolmogorov–Smirnov test. To test the conceptual model, Confirmatory Factor Analysis (CFA) was performed using LISREL software. Model fit indices included a χ^2 /df ratio of less than 3, RMSEA ≤ 0.05 or ≤ 0.08 , and AGFI and TLI values greater than 0.90, all of which indicated an acceptable and robust model fit. Accordingly, the quantitative phase of the study validated the smart academic governance model using a reliable instrument and advanced statistical analyses.

Results

Of the 357 faculty members who participated in the study, 186 individuals (52.10%) were male and 171 (47.90%) were female, indicating a relatively balanced gender distribution. Regarding work experience, 161 participants (45.10%) had 10 years of service or less, 108 participants (30.25%) had between 11 and 20 years, and 88 participants (24.65%) had 21 to 30 years of experience. This shows that the largest subgroup consisted of participants with fewer than 10 years of experience. In terms of academic rank, 116 participants (32.49%) were assistant professors, 145 (40.62%) were associate professors, and 96 (26.89%) were full professors, demonstrating that associate professors constituted the largest portion of the sample.

Before using inferential statistical tests, their assumptions must be met—one of the most important being the distribution of data. To verify normality, the Kolmogorov–Smirnov (K–S) test was

applied. If the obtained significance level is greater than 0.05, the distribution is considered normal; otherwise, it is non-normal. In the former case, parametric tests may be used; in the latter, non-parametric methods are required.

Table 1. Shapiro–Wilk Test Results

K-S Statistic	df	Significance Level
5.99	356	0.715

As shown in Table 1, the obtained significance level for the smart academic governance variable (0.715) is greater than 0.05, and the K–S statistic is 5.99. Therefore, the distribution of the smart academic governance data is normal. Accordingly, the conditions for applying parametric tests were satisfied. In structural equation modeling, the model does not rely solely on overall fit indices; the standardized beta and gamma coefficients (path coefficients) and their corresponding t-values for each causal path from the exogenous variable—smart academic governance—to the endogenous variables (causal, contextual, intervening, strategic, and consequential dimensions) must also be interpreted. The structural model illustrates how the latent variables are interconnected. These coefficients reflect the relative strength of each path. The standardized coefficients for the paths are presented in figure 1.

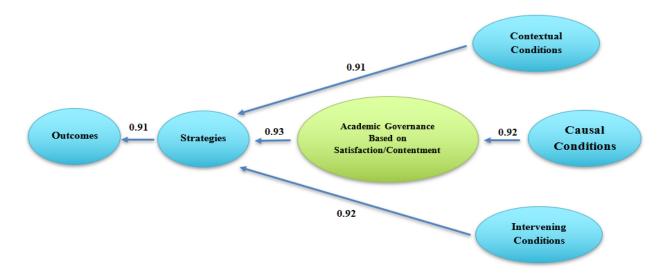


Figure 1. General Research Model (Standardized Coefficients)

Table 2. Path Analysis Results Based on LISREL Output

No.	Causal Path	Standardized Coefficient (γ/β)	t- value	P	Result
1	Smart Academic Governance → Causal Dimension	0.80	10.94	P < 0.001	Significant
2	Smart Academic Governance → Contextual Dimension	0.68	7.95	P < 0.001	Significant
3	Smart Academic Governance → Intervening Dimension	0.75	9.21	P < 0.001	Significant
4	Smart Academic Governance → Strategic Dimension	0.83	11.86	P < 0.001	Significant
5	Smart Academic Governance → Consequential Dimension	0.78	10.02	P < 0.001	Significant

The results in Table 2 indicate that the causal paths between the exogenous variable and the endogenous dimensions exhibit relatively strong effects. The largest effect corresponds to the strategic dimension ($\gamma = 0.83$), while the smallest pertains to the contextual dimension ($\gamma = 0.68$). These coefficients highlight the dominant role of smart strategic and decision-making structures within academic governance. The t-values further confirm the significance of all paths, as all values exceed the critical threshold of 1.96 and range from 7.95 to 11.86, indicating strong statistical significance at P < 0.001. In other words, all causal directions in the model were confirmed at the 99% confidence level.

To determine the model fit, various goodness-of-fit indices produced by LISREL were examined.

Table 3. Goodness-of-Fit Indices for the Structural Model

Index	Acceptable Range	Obtained Value
χ^2	<u>—</u>	7461.58
df	-	2688
χ^2/df	< 3	2.77
RMSEA	< 0.08	0.063
CFI	> 0.90	0.95
IFI	> 0.90	0.94
RFI	> 0.90	0.94
GFI	> 0.90	0.92
AGFI	> 0.90	0.90

Based on Table 3, the chi-square to degrees of freedom ratio is 2.77. The RMSEA value of 0.063 indicates an acceptable model fit. Other indices, such as GFI, AGFI, CFI, IFI, and RFI, all exceed 0.90, demonstrating desirable levels of model fit. As illustrated in Figures 1 and 2, the results of structural modeling indicate that the proposed model shows a relatively strong fit with the empirical data.

Discussion

The aim of this study was to develop and validate a model of *smart academic governance* in comprehensive universities in Tehran. The findings indicated that smart academic governance has a significant and positive effect on all dimensions of the research constructs. The standardized coefficients ranged from 0.68 to 0.83, and all *t*-values exceeded the critical value of 1.96 and were significant at the 0.001 level. This confirms the robustness of the causal relationships in the model and the satisfactory fit of the data. Notably, the strongest effect was observed in the strategic dimension ($\beta = 0.83$, t = 11.86, p < 0.001), suggesting that intelligence-driven academic governance most strongly enhances strategic decision-making and forward-looking planning in universities. Significant effects were also observed for the causal ($\beta = 0.80$, t = 10.94), consequential ($\beta = 0.78$, t = 10.02), intervening ($\beta = 0.75$, t = 9.21), and contextual ($\beta = 0.68$, t = 7.95) dimensions.

Confirmatory factor analysis demonstrated that all factor loadings exceeded 0.40 and that the corresponding significance coefficients lay outside the ± 1.96 range, indicating satisfactory relationships between indicators and components and confirming that the indicators play a meaningful role in measuring the components. In total, six dimensions, 22 components, and 121 indicators collectively represented an underlying factor within the framework of smart academic governance. Therefore, it can be concluded with confidence that the proposed model possesses sufficient validity.

The results of this research align with several studies, including those of Gheyrivani et al. (2023), Shakib et al. (2022), Ebrahimi & Abdollahi (2022), Zhou & Li (2022), and Kauko & Wiberg (2020). In interpreting the findings, it must be noted that laws and regulations pertaining to higher education and policy-making in the field of academic governance are essential. Rule of law, policy-making, and transparency are among the key components of academic governance in Iranian higher education, influencing its efficiency, quality, and effectiveness. Rule of law refers to governance based on legal frameworks and respect for the rights and responsibilities of stakeholders in higher education, which requires appropriate legal structures to ensure and protect these rights. Policy-making corresponds to decision-making and implementation of higher education policies and requires coordination and cooperation among the various organizations and sectors involved. Transparency entails the disclosure of information relevant to the higher

education system and requires systematic organization and accessibility of information to the public. Transparency and information disclosure serve as crucial tools for universities. Access regulations in different countries regarding information held by public authorities provide an important oversight mechanism. Stakeholder participation in political decision-making within universities depends on the availability of such information (Ablo, 2021).

Another component of academic governance is social responsibility. Social responsibility within academic governance involves attending to the needs and interests of both internal and external stakeholders—students, faculty, staff, government, society, and the environment. The role of a university in social responsibility is to promote civic engagement and active citizenship through volunteer activities, ethical practices, and community responsibility. Faculty, staff, and students are encouraged to responsibly engage with local communities through various programs. In this regard, the findings of Coderado (2021) emphasize student participation in university projects, which can influence their perceptions of academic life, their roles within and beyond the university, and foster an active civic mindset through creative action. This, in turn, contributes to the development of socially responsible and economically sustainable communities.

Stakeholder participation, collaboration, and consultation constitute another key component of university governance. The current governance model in Iranian higher education is centralized, and the multiplicity of decision-making bodies adds complexity. Such a top-down hierarchical structure has resulted in minimal stakeholder participation in governance processes. In many developing countries, including Iran, faculty members play a limited role in university governance; aside from teaching, research, and attending departmental meetings, they have little decision-making authority. Academic freedom, as observed in international contexts or in developed countries, is limited. Enhanced participation of faculty and staff in decision-making processes is essential; the more individuals are involved in these processes, the easier it becomes to implement policies and decisions.

Another important dimension is smart management of university affairs. Smart leadership entails guiding stakeholders to solve problems and achieve institutional goals. As Michael (2023) notes, higher education serves as a reservoir of intellectual capital, a driver of workforce development, and a major enterprise. A core function of university governance is to guide institutional policy, approve budgets, manage hiring and retention, develop strategies, and foster creativity and

efficiency. Smart leadership in universities includes several components—academic advising, career guidance, academic empowerment, student engagement, and effective communication with students. Ultimately, the primary goal of leadership is to enhance students' academic and professional success, supporting them in navigating their educational journeys (Ablo, 2021).

National and international transformations constitute another critical component. Universities must engage in environmental scanning and future-oriented thinking to anticipate societal needs. Findings indicate that universities should closely monitor scientific and technological developments and employ emerging technologies to meet future demands. Accordingly, universities must design appropriate educational programs that prepare students for growth and development within a globalized world. A study by Bakhshi (2020) found that internationalization, accountability, university vision, academic freedom, teamwork, foresight, transparency, and institutional structure are dimensions of good governance. Similarly, Nashaf (2019) reported that university governance provides a framework for determining higher education goals and managing resources, with its components—lawfulness, transparency, participation, and accountability—playing critical roles in improving educational quality, confronting technological challenges, and meeting advanced labor market needs.

Knowledge governance and academic autonomy represent another dimension of academic governance. This involves fostering knowledge production and dissemination within universities. The knowledge governance dimension encompasses the development of knowledge and awareness. Faculty members play a central role in producing and transferring knowledge, and by advancing their expertise and delivering high-quality instruction, they contribute to this mission. Given the key role of universities in generating new knowledge and supporting societal development, attention to knowledge governance can significantly advance long-term societal goals.

This study faced several limitations. It was conducted in comprehensive universities in Tehran, and only faculty members from these institutions were included, although ideally a broader sample from all universities and disciplines would have been preferable. Some faculty members declined participation due to heavy workloads, requiring the researcher to replace them with new respondents. Additionally, because comprehensive universities in Tehran differ significantly from

other institutions in terms of financial resources, faculty composition, and governmental attention, caution must be exercised when generalizing the findings to other universities.

Based on the findings regarding the smart academic governance model and the identification of six paradigm model dimensions—causal conditions, contextual conditions, intervening conditions, core phenomenon, strategies, and consequences—the following recommendations are offered:

- 1. The autonomy of universities should be formally recognized in laws, regulations, and national policy documents, and all university affairs should be delegated to the university's board of trustees.
- 2. University governance should be conducted through a general assembly composed of faculty members, with the board of trustees serving as the highest authority. An annual assembly should be held to present comprehensive performance reports, and faculty members should volunteer for managerial roles each year.
- 3. Smart systems such as administrative automation platforms should be implemented to monitor and follow up on logistical affairs, ensuring that all administrative processes are trackable by both managers and stakeholders.
- 4. Virtual and electronic learning platforms, equipped with proper support systems, should be used to deliver educational programs efficiently, minimizing loss of physical space, financial resources, and instructional time.
- 5. University leadership should select individuals with expertise in academic governance based on knowledge and experience. Binding regulations should be established to ensure that competence and professional background serve as the basis for appointments.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the ethics committee of Islamic Azad University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection, and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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