

# Design and Validation of an Innovative University Model in Iraq Universities

Ayad Razzaq Kadhim. Alafari<sup>1</sup>, Maryam. Taghvae Yazdi<sup>2\*</sup>, Muna Mohammed Abbas. Alkhateeb<sup>3</sup>, Kobra. Emami<sup>4</sup>

<sup>1</sup> PhD Student, Department of Educational Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

<sup>2</sup> Associate Professor, Department of Educational Management, Sari Branch, Islamic Azad University, Sari, Iran

<sup>3</sup> Assistant Professor, Department of Educational Sciences, College of Education, University of Babylon, Iraq

<sup>4</sup> Assistant Professor, Department of Educational Sciences, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

\* Corresponding author email address: m\_taghvaeeyazdi@yahoo.com

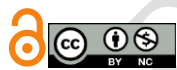
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### ABSTRACT

**Objective:** The present study was conducted to design and validate an innovative university model in Iraq universities.

**Methodology:** This research adopts an exploratory sequential mixed-method approach (quantitative and qualitative). The study population in the qualitative phase included key experts, faculty members, and university administrators, while in the quantitative phase, it comprised all faculty members and administrators of Iraq universities. The qualitative sample included 10 participants selected through purposive sampling until theoretical saturation was achieved, while in the quantitative phase, 385 participants were randomly selected. Data were collected through semi-structured interviews and analyzed using content analysis with coding, resulting in a model designed with 5 dimensions and 79 items.

**Findings:** For model validation, a questionnaire was initially designed, and after assessing face and content validity, 10 questions were removed, leaving 69 questions. The results indicated that all questions had a factor loading above 0.4, convergent validity above 0.5, reliability for both criteria (Cronbach's alpha, composite reliability) for all dimensions above 0.8, and acceptable discriminant validity. Ultimately, the model fit index exceeded 0.36, suggesting strong validity, reliability, and model fit.

**Conclusion:** Policymakers and planners can utilize the findings of this research as a guide to strengthen and develop universities, transforming them into innovative universities.

**Keywords:** Validation, Innovative University, Model, Iraq Universities.

## 1 Introduction

In the present era, innovation is recognized as one of the most critical factors for the economic and social growth and development of countries. Among these, universities, as primary centers for the production and dissemination of knowledge, play a vital role in advancing innovation and creating added value in society. Universities and higher education institutions must be innovative to adapt and align with today's dynamic and rapidly changing environment. These institutions have an inseparable link with innovation and play a significant role in implementing the national innovation system, positioning themselves as engines of innovation (Alipour, 2022; Alwali, 2024; Berestova, 2009).

Higher education institutions and universities produce the primary resources needed to create an innovative system, including educated individuals as human capital and novel ideas. Additionally, a university must independently progress towards realizing its envisioned goals. In this regard, achieving a transformative vision, given the limited resources available, is only possible by advancing along the path of innovation (Thomas et al., 2023).

Innovation in higher education, and specifically in universities, is an economic and entrepreneurial advantage that should be an integral part of the official activities of the university, faculty, and students. This approach expands skills to generate profit and added value for society. Such activities have a broad scope, focusing on identifying viable business opportunities, conducting research and teaching through the development of an innovative and entrepreneurial culture, and sharing skills for cultural and social benefits (Javanmardi & Abbaspour, 2022; Javanmardi et al., 2017; Javanmardi et al., 2018).

The theoretical framework for this study emphasizes innovation as a critical attribute of higher education institutions, particularly universities, in adapting to rapid societal and technological changes. Innovation involves the organization's ability to generalize, abstract, and implement creative ideas to respond to environmental challenges. Innovative organizations, including universities, are positioned to leverage new opportunities and must prioritize innovative activities while identifying resources and addressing constraints. Innovation extends beyond a national framework, entering a global innovation system, where higher education institutions are key to achieving social responsibility, fostering social change, and promoting sustainable development (Goyal & Akhilesh, 2007). An "innovative university" embodies this role by fostering

creativity and entrepreneurship, which begins with individual and team-level creativity but ultimately requires structured organizational support to succeed (Mahdi & Shafiee, 2018, 2020, 2023). Contrary to simplistic views linking innovation solely with technology, it encompasses a broader range of improvements in ideas, products, and processes that drive organizational efficiency, cost-effectiveness, and scalability (Tierney & Lanford, 2016). Consequently, innovation becomes a fundamental component for organizations, aligning educational institutions with societal and economic advancement goals.

Research on designing and developing models for innovative and entrepreneurial universities in Iran has identified several critical factors, including the establishment of standards, regulatory mechanisms, financial and non-financial supports, and process optimization as pivotal in fostering innovation within universities (Abdoli et al., 2024). A framework developed by Gholipour et al. (2023) emphasized personality traits, organizational structure, and information technology as key drivers of innovation in Iranian universities, advocating for a structured prioritization of these factors (Gholipour et al., 2024). Additionally, studies by Mahdi and Keikha (2023) highlighted the need for innovation in educational, research, social, and cultural functions and stressed that transformative governance and leadership reforms are essential in Iran's higher education system (Mahdi & Keikha, 2023). Alipour (2022) further explored the role of soft technologies, suggesting that they can bring profound changes to various social and ethical aspects of life (Alipour, 2022). Similarly, research by Barzegar et al. (2020) recommended that universities strengthen their leadership and training practices to stay aligned with global shifts, with organizational structures and human capital management playing a vital role (Barzegar et al., 2020). Ahmadzadeh and Shokouh (2020) emphasized the importance of social capital in fostering organizational innovation, particularly in enhancing trust, organizational interactions, work-life quality, and job autonomy (Ahmadzadeh & Shokouh, 2020). Another study by Pourabrehi et al. (2020) identified the importance of education reform and industry connections as essential to fostering technological and innovative universities (Pourebrahimi et al., 2021).

Jafarzadeh Ghadimi et al. (2018) proposed a model defining innovative universities along structural, strategic, research, environmental, and educational dimensions (Jafarzadeh Ghadimi et al., 2018). Similarly, studies in Iraq reveal a positive impact of psychological empowerment on

innovative behavior among faculty members, highlighting the role of inclusive leadership (Alwali, 2024). Other research by Turki (2024) found that lower work stress correlates with higher innovation capacity among university staff (Turki, 2024). Khirfech and Al-Ani (2024) indicated moderate feasibility for establishing university-based business incubators, with potential benefits for student entrepreneurship, recommending the adoption of international best practices (Khirfech & Al-Ani, 2024). Abdulkarem and Hasan (2024) showed that investment in education and research positively influences Iraq's economic growth, underscoring the importance of coordinated efforts to enhance educational quality and research (Abdulkarem & Hasan, 2024). Budur et al. (2024) demonstrated that knowledge sharing positively affects innovative behavior, with an innovative culture serving as a significant mediator (Budur et al., 2024). In a Polish context, Morawska-Jancelewicz (2022) examined the role of universities in social innovation, especially during global challenges like COVID-19, suggesting that universities should actively participate in social change. Her research proposed the "Socially Engaged University" model to enhance universities' roles in regional innovation systems, integrating the quadruple/quintuple helix model to address institutional changes and motivational structures (Morawska-Jancelewicz, 2022).

Universities as longstanding institutions primarily serve society by generating knowledge and technology, necessitating continual adaptation to remain relevant in the knowledge-driven economy. The innovative university represents a key part of the national innovation ecosystem, contributing to knowledge production and human resource development aligned with a knowledge-based economy (Swanger, 2016). An innovative university adapts in its structure, culture, vision, processes, and outputs, building resilience to economic competition and open systems that respond to industrial and commercial shifts. This adaptability is sustained through a balanced focus on individual, structural, and environmental dimensions, including traits like flexibility, risk tolerance, and independence on the individual level; structural and cultural changes; and broad external factors such as competitive, economic, and social conditions. Scholars argue that managing innovation is essential to organizational survival, with some institutions approaching it through intra-organizational strategies, while others adopt inter-organizational perspectives. In developing a robust framework for innovative universities, research highlights

the role of innovation in empowering institutions to meet future educational demands and societal needs while securing job stability and fostering adaptability among faculty and staff (Kazemi & Shakiba, 2014).

Iraq, as one of the developing countries in the Middle East, has been on a path of progress and development in recent years, driven by political transformations. Undoubtedly, universities in Iraq play a fundamental role in this journey, and with updated and accurate education and research, they can support the development of the nation's economy and industry. Iraq, with approximately 35 universities, some of which are among the top-ranked universities in the Arab region, possesses considerable potential for advancement in innovation. Recent studies on innovation in Iraq universities indicate that the country is on the right track. For example, Alwali's (2024) research demonstrated that psychological empowerment has a positive effect on the innovative work behavior of faculty members in Iraqi higher education institutions (Alwali, 2024). However, despite the progress made, significant challenges remain in transforming Iraq universities into innovative institutions. These challenges include a lack of essential infrastructure, limited financial resources, insufficient links between universities and industry, and a need to enhance the culture of innovation and entrepreneurship. In this regard, the design and validation of an innovative university model in Iraq universities can be an important step toward addressing these challenges and accelerating the transformation of the country's higher education system. Such a model, considering Iraq's specific conditions and leveraging the successful experiences of other countries, could provide a practical framework to guide Iraq universities toward innovation and entrepreneurship. The present study was conducted to design and validate an innovative university model in Iraq universities.

## 2 Methods and Materials

This study aimed to design and validate an innovative university model in Iraq universities, using a sequential exploratory mixed-method approach in two phases (qualitative and quantitative) during the 2024 academic year. The qualitative population included key experts, faculty members, and university administrators, with inclusion criteria based on knowledge production (published articles, innovations, or patents) within the past three years in this field. The quantitative population comprised all faculty

members and university administrators in Iraq universities. In the qualitative phase, a purposive sampling method was used to select 10 participants, while in the quantitative phase, a sample of 385 participants was calculated using Cochran's formula and selected through random sampling.

Data collection occurred in two stages, qualitative and quantitative. In the qualitative stage, data were gathered through semi-structured interviews until theoretical saturation was achieved. The qualitative data were analyzed using content analysis with coding through Maxqda2021 software. To ensure the validity of qualitative data, interpretations and inferences made from participants' responses were reflected back to them to prevent any misrepresentation of their views. Additionally, details of the research process, from sampling to data collection and analysis, were thoroughly documented to ensure transparency in transferability.

For quantitative data collection, a researcher-designed questionnaire was developed based on qualitative findings. The instrument's validity was determined using face and content validity, with content validity ratio (CVR) and content validity index (CVI) as indicators. The reliability of the instrument was assessed using Cronbach's alpha and composite reliability. For quantitative data analysis and structural model evaluation, confirmatory factor analysis, convergent validity, discriminant validity, R<sup>2</sup>, Q<sup>2</sup>, and t-values were applied using SmartPLS4 and SPSS23 software.

### 3 Findings and Results

The findings of this study were examined in both qualitative and quantitative sections. In the qualitative section, to identify the dimensions and concepts for the innovative university model in Iraq universities, semi-structured interviews were conducted and analyzed using theoretical saturation after 10 interviews. Following transcription, the interviews were initially analyzed to identify a specific and limited set of categories. In the second stage, concepts with higher conceptual relationships were grouped, with each group assigned a title. In the third stage, repetitive concepts were removed, and similar ones were merged. Ultimately, from an initial set of 743 concepts or codes, 79 concepts were extracted, which were then categorized into five dimensions through coding. To ensure the accuracy of qualitative data, several strategies were implemented, including ongoing review and comparison (researcher self-review), classification, and confirmation with research participants (member-checking), as well as external auditing. The identified concepts and dimensions were structured into five main dimensions: structural-organizational, research, strategy, interaction and communication, and educational, resulting in a total of 79 items (Table 1).

**Table 1**

*Content Analysis Results of Interviews and Coding Process: Open and Axial Coding of Model Dimensions and Concepts in the Qualitative Phase*

Axial Coding (Category)	Open Coding (Concepts)
Structural-Organizational	Existence of intellectual property laws in the production of articles and scientific books, patent registration, teamwork and group problem-solving, transparent information sharing, ensuring information security and risk, focus on decentralized structure, cooperation, coordination, and integration among units, encouragement and support for innovative suggestions, emphasis on organizational learning, sharing organizational knowledge, formation and development of innovative university-affiliated enterprises (start-ups, incubators, science and technology parks), flexible organizational structure, presence of an innovative scientific atmosphere, equitable and accountable education, precise and scientific selection and recruitment based on realistic criteria, support for students, colleagues, and graduates in moving from idea generation to business creation, availability of appropriate motivational methods, influence of faculty's innovative educational and research activities on their annual evaluation, promotion of self-monitoring, financial support for innovative activities, institutionalization of critical thinking, systematic critique, and professional commitment.
Research	Attraction of research funding and financial support for research, support for the establishment of joint research centers between industry and academia, involvement of faculty, staff, and students in scientific-research centers, organization of specialized workshops, conferences, seminars, competitions, and Olympiads, publication of research results in reputable scientific-research and ISI journals, foresight and future research, defining research issues based on internal and external sources, enhancing research levels and dialogue, joint publications with industry, theory development in fundamental, applied, and developmental domains, reward consideration based on innovation in research topics.
Strategy	Development of social responsibility towards society, focus on scientific authority and acceptability at domestic, regional, and international levels, commercialization of technology by converting university innovations into industrial products and outputs, revisiting goals and vision and re-engineering process implementation methods, guiding student theses and dissertations towards societal and industrial needs, formulation of research goals and priorities based on contemporary societal demands, practical application of research results, balanced advancement in science, technology, and innovation, acceleration in the idea generation



	process towards sustainable jobs, awareness of innovation's place in organizational strategy, development of a suggestion system, expansion of innovative fields, establishment of interdisciplinary and cross-disciplinary research centers, fostering a supportive environment for creative skill development, incorporation of innovation in strategies, support and encouragement for innovative research proposals, provision of mechanisms for supporting and encouraging high-risk, high-reward investments, positioning the university as a source of societal transformation, approved research projects with priority on targeted applied research based on national development plans and the comprehensive scientific role of the nation.
Interaction and Communication	Transfer of academic knowledge and employee training for industries through conferences and special lectures, availability of educational and research spaces for creative, innovative, and entrepreneurial researchers, search for potential partners in industry and government, forums for dialogue with the presence of all university and non-university stakeholders, establishment of international academic and research partnerships.
Educational	Focus on quality of individuals and processes, teaching topics and subjects related to innovation, use of innovative educational methods, transformation of theoretical knowledge into experiential and practical knowledge, use of educational standards, organization of skill-training programs for students, motivation and provision of rewards in applying creativity and innovation, alignment of presented content with technological advancements and global, multicultural demands, upgrading and updating equipment, technologies, and educational programs and curricula, provision of diverse informal learning opportunities to stimulate the development of innovative thinking and skills, instruction on social responsibility towards society, short-term and medium-term informal education for faculty and students, respect for students' ideas and desires.

For the quantitative phase, a researcher-designed questionnaire was developed based on the findings from the qualitative phase. To determine the validity of the designed questionnaire, face and content validity were assessed by 12 experts. In face validity, after calculating the impact score of each item, three items scoring below 1.5 were removed, reducing the items from 79 to 76. In content validity, four items with a content validity ratio (CVR) below 0.56 were removed, further reducing the items to 72. Three additional items with a content validity index (CVI) below 0.79 were eliminated, resulting in a final set of 69 items. Each item was rated on a five-point Likert scale in the finalized questionnaire. The findings indicated that the factor loading

for all items exceeded 0.4, and the t-values for all items related to the five identified dimensions were greater than 2.58, confirming the validity of each item in measuring its corresponding factor with 99% confidence. The reliability of both metrics (Cronbach's alpha and composite reliability) for all dimensions was above 0.8, and the average variance extracted (AVE) for all factors was greater than 0.5. Additionally, the square correlation of each factor with others was less than the AVE for that factor, indicating the presence of discriminant validity. Thus, the measurement model was accepted in terms of both convergent and discriminant validity.

**Table 2**

*Factor Loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), t-value, R2, and Q2 for the Structural-Organizational Dimension*

Items	Factor Loading	t-value	AVE	Composite Reliability	Cronbach's Alpha	R2	Q2
Existence of intellectual property laws in producing articles and books, patent registration	0.257	0.023	0.522	0.937	0.929	0.821	0.314
Teamwork and group problem-solving	0.663	11.589					
Transparent information sharing	0.673	10.026					
Assurance of information security and risk	0.616	8.092					
Focus on decentralized structure	0.608	7.344					
Cooperation, coordination, and integration among units	0.724	13.442					
Encouragement and support for innovative suggestions	0.758	7.574					
Emphasis on organizational learning	0.686	15.805					
Sharing organizational knowledge	0.667	9.087					
Formation and development of university-affiliated innovative enterprises (start-ups, incubators, science and technology parks)	0.740	14.542					
Flexible organizational structure	0.723	10.767					
Presence of an innovative scientific environment	0.686	11.934					
Equitable and accountable education	0.650	9.837					
Precise and scientific selection based on realistic criteria	0.709	13.522					
Support for students, colleagues, and graduates in moving from idea generation to business creation	0.544	10.068					
Availability of suitable motivational methods	0.649	8.809					
Influence of innovative educational and research activities on annual faculty evaluations	0.668	7.311					

Respect for diverse opinions, desires, and preferences among organizational members	0.716	11.169
Promotion of self-monitoring	0.649	10.622
Financial support for innovative activities	0.504	4.565
Institutionalization of critical thinking, systematic critique, and professional commitment	0.567	5.310

**Table 3**

*Factor Loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), t-value, R2, and Q2 for the Research*

*Dimension*

Items	Factor Loading	t-value	AVE	Composite Reliability	Cronbach's Alpha	R2	Q2
Research funding and financial support	0.662	7.478	0.565	0.905	0.840	0.812	0.345
Support for the establishment of joint research centers between industry and academia	0.675	8.244					
Faculty, staff, and student participation in scientific-research centers	0.672	7.324					
Organization of specialized workshops, conferences, seminars, competitions, and Olympiads	0.536	10.353					
Publication of research results in reputable scientific-research and ISI journals	0.673	7.998					
Foresight and future studies	0.724	5.289					
Defining research issues from internal and external sources	0.617	4.327					
Enhancement of research levels and dialogue	0.736	10.128					
Joint publications with industry	0.685	9.328					
Theory development in fundamental, applied, and developmental fields	0.732	11.879					
Reward consideration based on innovation in research topics	0.761	8.095					

**Table 4**

*Factor Loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), t-value, R2, and Q2 for the Strategy*

*Dimension*

Items	Factor Loading	t-value	AVE	Composite Reliability	Cronbach's Alpha	R2	Q2
Practical application of research results	0.715	13.165	0.511	0.952	0.946	0.913	0.428
Balanced advancement in science, technology, and innovation	0.750	12.720					
Acceleration in idea generation and transition to sustainable jobs	0.757	9.700					
Awareness of innovation's role in organizational strategy	0.685	8.701					
Development of suggestion systems	0.714	7.852					
Expansion of innovative fields	0.784	5.714					
Establishment of interdisciplinary and transdisciplinary research centers	0.720	9.660					
Supportive environment for creative skill development	0.752	9.347					
Integration of innovation in strategies	0.793	9.742					
Support and encouragement for innovative research projects	0.712	9.700					
Mechanisms for high-risk, high-reward investments	0.674	8.701					
University as a source of societal transformation	0.696	7.852					
Approved research projects with priority on targeted applied research based on national development plans	0.628	5.714					

**Table 5**

*Factor Loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), t-value, R2, and Q2 for the Interaction and*

*Communication Dimension*

Items	Factor Loading	t-value	AVE	Composite Reliability	Cronbach's Alpha	R2	Q2
International collaborations in education and research among universities	0.542	14.218	0.563	0.865	0.806	0.624	0.306
Forums for dialogue with participation from all university and non-university stakeholders	0.691	6.410					
Seeking potential partners in industry and government	0.536	12.054					
Availability of educational and research spaces for creative, innovative, and entrepreneurial researchers	0.603	10.902					
Transfer of academic knowledge and training for industry employees through conferences and special lectures	0.566	16.978					

**Table 6**

*Factor Loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), t-value, R2, and Q2 for the Educational Dimension*

Items	Factor Loading	t-value	AVE	Composite Reliability	Cronbach's Alpha	R2	Q2
Focus on the quality of individuals and processes	0.747	12.345	0.548	0.940	0.931	0.819	0.412
Teaching topics and courses related to innovation	0.703	9.354					
Use of innovative and novel educational methods	0.785	8.810					
Transforming theoretical knowledge into practical and applied knowledge	0.786	7.687					
Use of educational standards	0.720	14.204					
Organization of skill-training programs for students	0.723	8.803					
Motivation and rewards for applying creativity and innovation	0.731	10.518					
Alignment of content with technological advances and global, multicultural requirements	0.725	10.244					
Upgrading and updating equipment, technologies, and educational curricula	0.843	10.086					
Provision of diverse informal learning opportunities for fostering innovative thinking and skills development	0.686	8.810					
Instruction on social responsibility toward society	0.750	7.687					
Respect for students' ideas and desires	0.712	14.204					
Short-term and medium-term informal training for faculty and students	0.694	8.803					

**Table 7**

*Fornell-Larcker Criterion for Discriminant Validity Assessment*

Dimension	Educational	Strategy	Interaction and Communication	Innovative University	Structural-Organizational	Research
Educational	0.740					
Strategy	0.715	0.816				
Interaction & Comm.	0.666	0.750	0.783			
Innovative Univ.	0.635	0.793	0.906	0.965		
Structural-Org.	0.611	0.650	0.780	0.808	0.907	
Research	0.682	0.730	0.755	0.771	0.851	0.902

According to the research findings, the R2 values for all dimensions were greater than 0.79, indicating a strong model fit. Additionally, the impact of each dimension on innovative universities was ranked in order of significance: strategy

(0.956), structural-organizational (0.907), educational (0.906), and research (0.902). Given that the t-values for all identified dimensions exceeded 2.58, the effects of these dimensions are confirmed at a 99% confidence level.

**Table 8**

*Direct Path Analysis of the Impact of Innovative University Dimensions in Iraq Universities*

Direct Path	Path Coefficient	t-value	Standard Error	Significance
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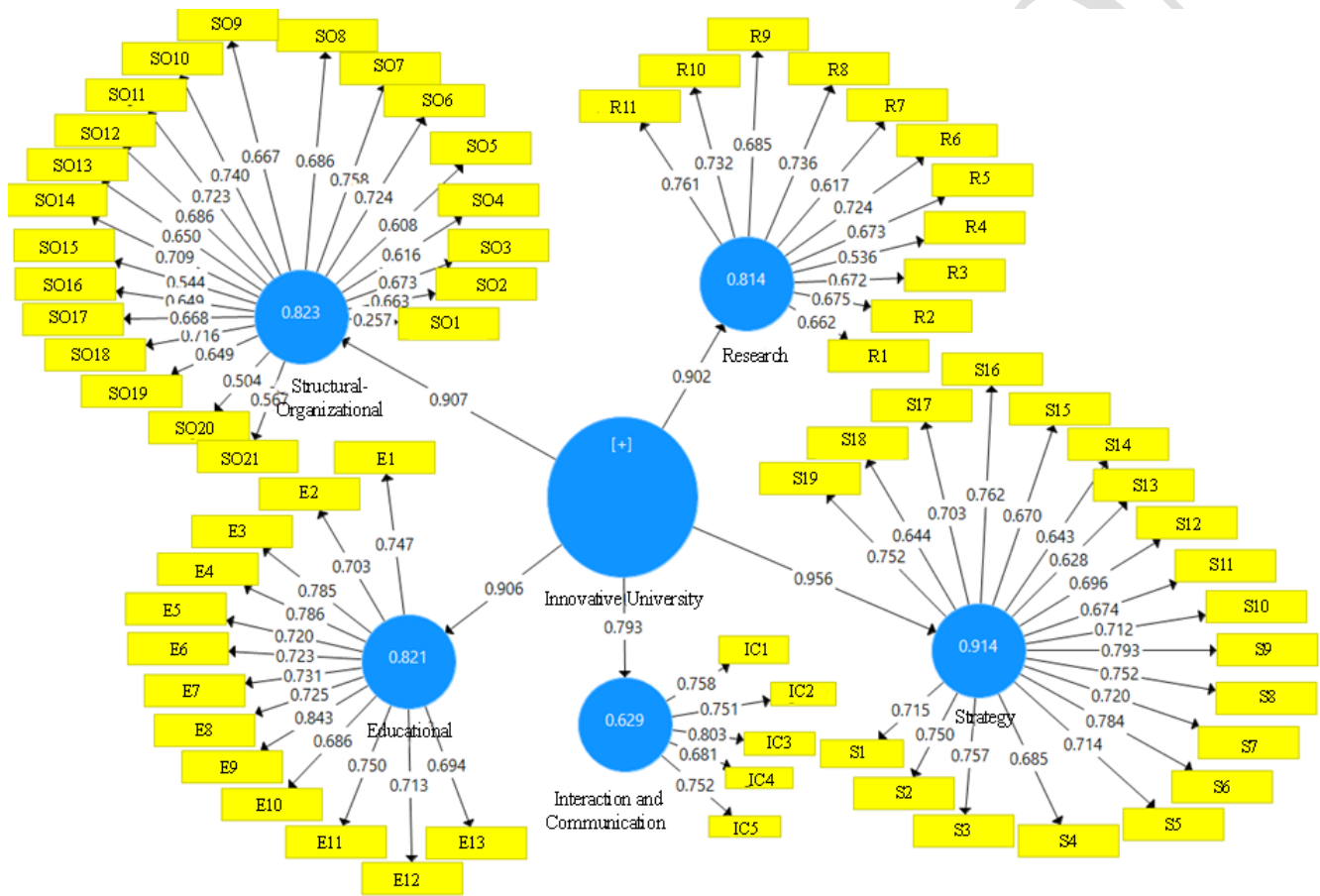
Innovative University -> Educational	0.906	28.978	0.031	0.000
Innovative University -> Strategy	0.956	85.477	0.011	0.000
Innovative University -> Interaction & Communication	0.793	14.974	0.053	0.000
Innovative University -> Structural-Org.	0.907	35.451	0.026	0.000
Innovative University -> Research	0.902	39.331	0.023	0.000

To assess the model’s overall fit, the Goodness of Fit (GOF) index was employed. GOF values of 0.01, 0.25, and 0.36 are considered weak, moderate, and strong,

respectively. Since the calculated GOF values exceeded 0.36, this indicates a strong and well-fitting research model.

Figure 1

Estimation of Variable Effects Based on Standardized Coefficients



#### 4 Discussion and Conclusion

The findings of this study indicate that the innovative university model for Iraq universities consists of five main dimensions: 1. Structural-Organizational, 2. Research, 3. Strategy, 4. Interaction and Communication, and 5. Educational. This five-dimensional model reflects the comprehensiveness and complexity of the concept of an innovative university, with each dimension playing a significant role in the formation and development of such a university. The structural-organizational dimension, with 21

indicators, has the highest number of indicators, highlighting the importance of organizational infrastructure in fostering and maintaining innovation in universities. Indicators such as "existence of intellectual property laws," "teamwork and group problem-solving," and "flexible organizational structure" demonstrate that an innovative university requires a strong support structure that both welcomes and protects new ideas. The research dimension, with 11 indicators, underscores the importance of research and development in innovative universities. Indicators such as "attracting research funding," "support for establishing joint research



centers between industry and universities," and "foresight and future studies" show that innovative universities must operate at the forefront of knowledge and maintain strong connections with industry. The strategy dimension, with 19 indicators, emphasizes the importance of strategic planning and goal-setting in the path toward innovation. Indicators such as "development of social responsibility toward society," "technology commercialization," and "balanced development of science, technology, and innovation" demonstrate that innovative universities must have a comprehensive and long-term perspective. The interaction and communication dimension, with 5 indicators, stresses the importance of both internal and external communications within the university. Indicators such as "transfer of academic knowledge to industries" and "international collaborations among universities" suggest that innovative universities should establish and maintain an extensive network of relationships. The educational dimension, with 13 indicators, emphasizes the importance of innovation in educational processes. Indicators such as "use of innovative educational methods," "transformation of theoretical knowledge into practical and applied knowledge," and "teaching social responsibility" demonstrate that innovative universities must transform their educational methods to align with societal needs.

The findings of this research align with the work of Jafarzadeh Ghadimi et al. (2018), who identified five dimensions—structural, strategic, research, environmental, and educational—as components of an innovative university (Jafarzadeh Ghadimi et al., 2018). They also resonate with Javanmardi et al. (2017), who proposed a model of innovative universities comprising individual, group, and institutional components, each examined through three main functions: education, research, innovation, and entrepreneurship (Javanmardi et al., 2017). However, this study also introduces unique aspects, including alignment with global models, such as Etzkowitz's entrepreneurial university model and the Triple Helix model, which emphasizes the university's connection to industry and society. This study also aligns with findings from Morawska-Jancelewicz (2022), which highlights the role of universities in social innovation in the quadruple/quintuple helix model (Morawska-Jancelewicz, 2022). Additionally, this research places special emphasis on the structural-organizational dimension, possibly reflecting the critical role of organizational infrastructure within the context of Iraq universities. The focus on social responsibility is notable in this model, with indicators such as "development of social

responsibility toward society" and "teaching social responsibility," aspects that are often less emphasized in classical models of innovative universities. Moreover, the focus on foresight, as evidenced by the "foresight and future studies" indicator in the research dimension, reflects a particular emphasis on the future, likely stemming from the need for Iraq universities to rebuild and modernize following extended periods of instability. The model's emphasis on international collaboration, with indicators like "international collaborations among universities," underscores the importance of global partnerships, reflecting Iraq universities' efforts to reconnect with the global academic community.

This study presents a comprehensive, multidimensional model of an innovative university tailored to the context of Iraq universities, showing that structural, research, strategic, communicational, and educational aspects must all be considered to establish an innovative university. The findings can serve as a guide for policymakers and university administrators in Iraq, shedding light on the specific challenges Iraq universities face in their journey to becoming innovative institutions. The focus on social responsibility and foresight highlights the need for these universities to play an active role in the country's reconstruction and development. However, this research faced limitations, including challenges in accessing experts and specialists in the qualitative phase and a lack of comparable studies within Iraq. Ultimately, this study lays the groundwork for further research in this area. Future studies are recommended to examine the obstacles to implementing this model in Iraq universities and to offer practical solutions for advancing toward this model.

### Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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