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Developing a Public Policy Model for IT-Based Education in Municipalities of Iranian Metropolises: A Qualitative Study

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Abstract

This study aims to design a public policy model for information technology-based education in the municipalities of Iranian metropolises using a qualitative research approach and grounded theory methodology. Data were collected through in-depth interviews with 16 academic elites and senior managers and were analyzed until theoretical saturation was achieved. The coding process included three stages: open, axial, and selective coding, ultimately leading to the extraction of six main categories and 106 subcategories. The findings revealed that employee participation, a participatory organizational culture, transparency in actions, and the development of cultural-educational programs are among the key factors in formulating effective policies. Furthermore, legal and environmental barriers—such as economic challenges and the absence of feedback mechanisms—exert a significant influence on the policy-making process. The proposed strategies were formulated across three levels: short-term (motivational and behavioral), mid-term (research-based and social), and long-term (cultural and legal). The results emphasize that aligning educational programs with organizational needs and strengthening management information systems plays a fundamental role in enhancing the quality of IT-based educational policymaking. By presenting a localized model, this study offers a practical framework for urban policymakers to optimize educational processes.

Keywords: public policymaking, IT-based education, employee participation, qualitative study

1. Introduction

Decision-making in organizations, as the process of selecting the best solution from among available alternatives, plays a fundamental role in management. According to Herbert Simon, decision-making is the essence of management, and organizations that effectively collect, process, and evaluate internal and external information can gain a competitive advantage (Parsakia et al., 2023). Management information systems, as key tools supporting managers in decision-making, are composed of hardware, software, databases, and communication networks, and are responsible for collecting, processing, and distributing information (Eriksson et al., 2025; Shepherd et al., 2024). According to the University of England, information systems utilize information technology to collect, process, and disseminate data. Kumar (2006) defines information systems as a combination of three components: management, information, and systems. He states that management guides business performance through planning, organizing, innovating, and controlling; information refers to analyzed data; and systems are a

set of interrelated components aimed at achieving a common goal. Management information systems are comprehensively and integratively designed to provide suitable information for managers, and at higher managerial levels, decision-making becomes more strategic and unstructured (Ochuba et al., 2024; Sharma, 2025). Management information systems play a crucial role in organizational decision-making, as decision-making becomes challenging without access to reliable information. These systems offer systematic tools, timely data, and appropriate managerial policies, establishing a solid framework for making complex decisions (Deng et al., 2021). One of the most important benefits of these systems is enabling managers to plan precisely for routine evaluations, identify problems, and enhance organizational productivity. Moreover, the efficient management of information systems leads to cost and resource savings and facilitates the simultaneous execution of multiple tasks. Management information systems also function as repositories for confidential information and ensure easy data retrieval through the use of databases (Gheisari et al., 2019).

In recent years, automated information systems have had a significant impact on the decision-making process by replacing human labor in certain tasks, thus increasing accuracy and reducing costs. These systems are capable of performing technical analyses at an optimal level, allowing managers to interpret data using automated systems rather than manual assessments (Sadegh Ghaderi & Zarei Zavaraki, 2022). Beyond data collection and processing, management information systems also act as tools to distinguish favorable decisions from unfavorable ones. After evaluating the information, appropriate decisions are confirmed, and inefficient options are eliminated. Ultimately, management information systems offer effective alternatives to decision-makers, facilitating optimal choices that ensure intelligent and efficient decision-making (Nowduri, 2011).

Management information systems play a vital role in the policymaking process, as the more accurate and advanced these systems are, the more reliable information they provide to decision-makers, leading to decisions aligned with overarching policy objectives. Information technology and policymaking are mutually interactive; individual decisions are directly connected to organizational decisions, and organizations interact with both their environments and society (Cairney, 2021). At every stage of the policymaking process—from problem identification to implementation and oversight—information systems act as providers of accurate data, and their development is also influenced by the policies adopted. For example, in credit risk management, a country aiming to reduce corruption and improve bank efficiency must invest in developing information systems, as information is the primary factor in risk management (Arvand & Vahedi, 2016).

According to a systems approach (butterfly effect from chaos theory), organizational decisions and policies directly impact society, and organizations require accurate and sufficient information for proper decision-making. Information systems fulfill this need and support the formation of sound decisions across various levels. Public institutions such as governments and parliaments are composed of smaller systems whose data play a decisive role in decision-making; the more efficient these systems are, the more accurate the information they provide. Failures in the formulation and implementation of proper policies can have significant consequences for society and government (Danaee Fard & Alvani, 2012).

In urban management, urban policymaking comprises a set of decisions aimed at implementing city strategies. This process includes studying the performance of stakeholders, examining their motivations, and analyzing their interactions in both formal and informal decision-making. Moreover, official structures of urban decision-making should be aligned with the responsibilities of urban managers and the geographical and functional divisions of the city (Asgarzadeh, 2020).

This study investigates the role of *evidence-based policymaking* in enhancing managerial decisions and emphasizes that the use of precise data and documented information can improve the quality of urban policies. Focusing on the urban management system of Urmia, challenges such as the multiplicity of urban service organizations and the need to establish an inter-organizational research system are explored (Ahmadi Nik & Taheri Goodarzi, 2017; Angazi Ghods et al., 2022). The relationship between information systems and the effectiveness of public policies is of critical importance because the more accurate and efficient these systems are, the more effective the decisions made by public institutions will be.

At the national level, it is necessary to develop information systems and shift the perspective from an organizational to a macro-level view. The present study analyzes the gap between urban research outcomes and decisions made in IT-based educational systems and adopts the supply-demand model as a suitable framework. Using the constructivist grounded theory approach, the research processes in Urmia's system are identified and modeled. Ultimately, a localized public policymaking

model for IT-based education is developed and formulated, integrating qualitative data to optimize managerial decision-making.

2. Methods and Materials

This study, aimed at developing a model for public policymaking in IT-based education, focuses on qualitative data analysis. Classified as applied research, it uses qualitative data collection methods to explore relevant concepts and theories. The required data were gathered through library studies, including journal articles, theses, and books, and key components and indicators were identified.

In the qualitative phase, the grounded theory method was employed to analyze the data, and findings from descriptive statistical analysis clarified participants' perspectives. Employees of municipalities in Iranian metropolises were selected as participants, and qualitative data were collected through in-depth interviews. Theoretical sampling was used to analyze events and extract categories related to public policymaking in IT-based education. Interviews were recorded and analyzed to examine participants' viewpoints.

The sampling process continued until theoretical saturation was reached, and data were coded concurrently to enable systematic and precise analysis. To ensure the accuracy and validity of the initial research phase, actions such as participant validation, peer review, and direct involvement of participants in data analysis were undertaken.

This research uses grounded theory to analyze key concepts of public policymaking in IT-based education, with qualitative data collection. The study utilized open, axial, and selective coding to present a suitable conceptual model. The inductive approach of grounded theory identifies concepts based on the data and uses constant comparison to generate theory. Rather than testing prior hypotheses, this approach extracts new concepts from the data and contributes to the development of a policymaking model in IT-based education.

Grounded theory, through systematic analysis, defines the relationships among categories and presents an interpretive structural modeling framework as the study's theoretical foundation.

3. Findings and Results

This study, utilizing a qualitative approach and grounded theory, investigated public policymaking in IT-based education. The researchers initially identified several main themes for the interviews and gathered the experiences of the participants. Following preliminary coordination, interviews were recorded, transcribed, and key statements were extracted. These statements were then categorized into 106 subcategories based on conceptual relationships. The statistical population consisted of 16 academic elites and municipal managers from Iranian metropolises, selected through snowball sampling. In-depth interviews continued until theoretical saturation was reached in order to formulate an appropriate model for policymaking in this field.

Open Coding

Open coding is a key phase in grounded theory involving the analysis of data through labeling and categorization, aiming to identify phenomena present in the data. In this stage, the data were broken down into discrete parts, and their similarities and differences were examined. Each event, idea, or concept in the data was given a specific label, and similar concepts were grouped under broader categories. Extracted categories possessed a higher level of abstraction compared to detailed concepts and could encompass multiple subcategories under a shared title. The naming of these categories had to correspond accurately with the studied data to precisely convey the intended content and meaning. In this study, the results of open coding were organized under the extracted categories. However, for the sake of brevity, repetitive and detailed descriptions have been omitted. Table 1 presents the results of open coding.

Table 1. Results of Open Coding

Themes	Dimensions	Number of Codes	Examples of Related Instances
Social	Vision	3	Enhancing participation is part of the vision of governmental organizations (municipality).
	Goal setting	5	Setting goals should aim at promoting participation.
	Communication skills	10	Communication skills in governmental organizations (municipality) vary.

	Experiential usefulness	7	Enhancing participation leads to experiencing its benefits.
	High participation morale	8	High morale for participation should be monitored.
Managerial	Teamwork culture	12	Teamwork culture promotes participation.
	Managers' openness to criticism	11	Managers' openness to criticism encourages participatory responses.
	Professional interaction approach	12	Expand the professional approach to interaction.
Participation Promotion	Ethics development	10	Promoting participation equates to ethical development.
	Respect for other ideas	12	Respect for diverse opinions arises from participation.
	Altruism and equality	7	Altruism and equality fulfill the true meaning of participation.
Environmental	Social factors	6	Through changes in social factors, participation can be enhanced.
	Cultural factors	9	The importance of participatory culture has been neglected.
	Economic factors	10	A weak economy reduces participation.
	Political factors	8	Political issues can affect participation.
Legal	Weak implementation	13	Implementation is not facing suitable conditions.
	Lack of feedback mechanisms	14	No effective feedback system exists.
	Absence of mechanisms to amend laws	7	We need appropriate mechanisms for legal reform.
Internal	Educational level	7	Higher education leads to more rational policymaking.
	Organizational culture	10	To what extent is the organizational culture participatory?
	Degree of participation	12	Organizational participation ranges from very high to very low.
	Organizational justice	6	Organizational justice varies across governmental organizations (municipalities).
External	Inter-organizational communication	9	External communication can play a key role in participation.
	Media	10	Media can support the promotion of participation.
	Environmental incidents and drivers	7	Environmental events can change participation levels.
Short-term	Perceptual actions	7	Perceptual changes lead to a shared organizational culture.
	Motivational actions	8	Improve motivation for participation.
	Behavioral actions	4	Behavioral measures require in-depth analysis.
Mid-term	Research actions	6	Research actions can lead to success in participation enhancement.
	Social actions	5	Organize social activities focusing on participation enhancement.
	Economic actions	10	A weak economy reduces participation.
Long-term	Cultural actions	9	Promote cultural programs to support participation.
	Legal actions	8	Appropriate legal mechanisms must be established.
Individual	Increasing employee trust	8	Enhanced employee trust fosters participatory impact.
	Preserving dignity and position	10	Participation helps to properly define employee dignity and status.
	Establishing justice	11	Participation ensures the realization of justice.
Organizational	Transparency in actions	9	Transparency results from improved participation in municipalities.
	Meritocracy	10	Participation is a prerequisite for discussing meritocracy.
	Policy implementation facilitation	9	Participation facilitates policy implementation.
	Sustainable development	9	Sustainable development stems from participation efforts.
	Enhancing accountability of officials	10	Participation improves the quality and quantity of officials' accountability.
	Goal achievement	11	Achieve goals in the shortest time through enhanced participation.
Social	Development of social activities	13	Social activity development results from participation in municipalities.
	Increased social calm	10	Participation increases societal tranquility.
	Reduction of social harm	10	Participation reduces social damage.
	Reduced currency outflow	13	Participation curbs foreign currency outflow.
	Enhanced domestic production capacity	14	Participation eases the path to increasing domestic production.
	Reduced diplomatic and political pressure	9	Participatory municipalities reduce diplomatic and political strain.
	Increased cultural and social content production	9	Enhanced participation supports content creation in cultural and social domains.

Axial Coding

Axial coding is a phase in grounded theory methodology that focuses on establishing connections among the categories derived from open coding. This process is conducted based on the paradigm model and aids in the development of the studied theory. In this phase, a core category is selected, and other subcategories are linked to it as causal conditions, intervening conditions, contextual conditions, strategies, and consequences (Strauss & Corbin, 1998). In the present study, axial coding

was employed to identify the key elements of public policymaking in IT-based education within the municipalities of Iranian metropolises and to analyze the relationships among influencing factors. Table 2 presents the results of axial coding.

Table 2. Results of Axial Coding

Dimension	Component
Core Phenomenon	1- Enhancing employee participation, 2- Expanding ethical values, 3- Respect and appreciation for differing views and opinions, 4- Altruism and equality
Intervening Conditions	Internal Factors: 1- Age, 2- Religion and denomination, 3- Race and ethnicity, 4- Educational level, 5- Occupation, 6- Organizational culture, 7- Degree of participation, 8- Organizational justice
	External Factors: 1- Inter-organizational communication, 2- Media, 3- Competition for policymaking centers, 4- Geographic context of participation, 5- Environmental incidents and drivers, 6- International actions
Contextual Conditions	Environmental Factors: 1- Social, 2- Cultural, 3- Economic, 4- Political
	Legal Factors: 1- Absence of legislation, 2- Weak implementation, 3- Lack of feedback, 4- Absence of legal mechanisms for reform, 5- Law revision
Strategies	Short-Term: 1- Perceptual actions, 2- Motivational actions, 3- Behavioral actions
	Mid-Term: 1- Research actions, 2- Social actions, 3- Economic actions
	Long-Term: 1- Cultural actions, 2- Legal actions
Consequences	Individual: 1- Increased satisfaction and calm, 2- Problem identification through participation, 3- Enhanced employee trust, 4- Listening to concerns and issues, 5- Preserving dignity and position, 6- Retention within the organization, 7- Intellectual property protection, 8- Alignment and support, 9- Responding to individual needs, 10- Talent attraction and retention, 11- Growth of experts
	Organizational: 1- Transparency in actions, 2- Meritocracy, 3- Problem resolution, 4- Reduced organizational costs, 5- Performance improvement, 6- Facilitating policy implementation, 7- Service quality enhancement, 8- Increased productivity, 9- Attention to political values, 10- Stability and status quo maintenance, 11- Sustainable development, 12- Link between academic environments and policymaking centers, 13- Establishment of think tanks, 14- Scientific enthusiasm, 15- Reduced corruption, 16- Decreased partisan and individual decisions, 17- Enhanced accountability of officials, 18- Goal achievement, 19- Forecasting and acceleration of tasks, 20- Identification of appropriate public policies, 21- Detection of deviations in programs and policies
	Social: 1- Expansion of social activities, 2- Increased societal tranquility, 3- Reduced social harm, 4- Decreased foreign currency outflow, 5- Strengthened domestic production capacity, 6- Heightened interest and motivation, 7- Reduced diplomatic and political pressure, 8- Increased presence in international markets, 9- Increased inclination toward participation

Selective Coding

In this study, selective coding is introduced as a critical phase in theory development. This stage involves determining the relationships among the main categories of the study, ultimately leading to the formulation of a comprehensive model of public policymaking in IT-based education for municipalities of Iranian metropolises. The interconnections between causal conditions, contextual conditions, and intervening factors reveal that causal conditions significantly influence the policymaking process. Table 3 presents the results of selective coding.

Table 3. Results of Selective Coding

Dimension	Component
Causal Conditions	1- Managerial factors, 2- Social factors, 3- Organizational factors
Phenomenon	Enhancing employee participation
Intervening Conditions	1- External factors, 2- Internal factors
Contextual Conditions	1- Legal factors, 2- Environmental factors
Strategies	1- Long-term strategy, 2- Mid-term strategy, 3- Short-term strategy
Consequences	1- Social consequences, 2- Organizational consequences, 3- Individual consequences

4. Discussion and Conclusion

The present study aimed to design a public policymaking model for IT-based education in the municipalities of Iranian metropolises, utilizing a qualitative research methodology. The analysis of the findings in the selective coding phase led to the development of a model consisting of six core categories and 106 subcategories, addressing the dimensions and components influencing the process of public policymaking in this domain. Given the limited research conducted on public policymaking in IT-based education, a comprehensive and integrated definition of the subject has not yet been provided. Most prior studies have explored certain aspects of the phenomenon by explaining selected components, but few have presented a comprehensive model with a practical approach. Previous research has largely followed a deductive methodology, and in some cases has been restricted to assessing the perceptions of managers and experts.

In contrast, this study adopted an exploratory and inductive approach to the policymaking process, aiming to achieve a more accurate understanding of influencing factors. The results of this study indicate that organizational support and a participatory culture play a key role in public policymaking processes related to IT-based education. Effective educational programs must

be designed collaboratively with managers to ensure successful implementation and to cultivate skilled and creative professionals. The lack of alignment between previous programs and managerial needs has made the development of coherent policies a fundamental priority for organizational growth and development.

The findings of this research align significantly with the prior studies (Angazi Ghods et al., 2022; Arnaboldi & Azzone, 2020; Asgarzadeh, 2020; Cairney, 2021; Chandoev & Wasic, 2021; Deng et al., 2021; Ebrahimian et al., 2022; Gheisari et al., 2019; Kaplan et al., 2022; Moslemi et al., 2021; Sadegh Ghaderi & Zarei Zavaraki, 2022), all of which emphasize the necessity of formulating IT-based educational policies. Overall, the enhancement of information technology in the municipalities of Iranian metropolises is identified as a core strategy for achieving effective educational approaches, improving efficiency, and increasing responsiveness to organizational and societal needs.

Preparing employees for future work environments and empowering them are among the key objectives of such policymaking. The position of municipalities and their significant role in the policymaking process have a direct impact on organizational and social outcomes, leading to higher levels of participation in IT-based educational processes within these urban institutions.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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