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# Designing Teachers' Participatory Decision-Making Model Using Delphi Combined Method and Interpretive Structural Modeling (ISM) (Case study: Second Year of Secondary Education in Lorestan Province)

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**Abstract**

**Purpose:** The purpose of this study is to design a participatory decision-making model for teachers of the second year of secondary education in Lorestan province. In this regard, first, using library and field studies, the components of teachers' participatory decision-making were initially identified. Then, using interviews with experts and based on the Delphi method, the identified factors are finalized. Statistical society is given by the teachers of the second year of secondary education in Lorestan province.

**Methodology:** The research was finalized using Delphi method including 5 main indicators of individual-personality traits, team-collective characteristics, communication-social characteristics, organizational characteristics and technical-specialized characteristics and related sub-indices. Then, using identified factors and based on interpretive structural modeling (ISM), a native model of teachers' participatory decision making was presented.

**Findings:** Relationships between factors indicate the effectiveness of improving and eliminating challenges and promoting the participatory decision-making model of teachers.

**Conclusion:** The factor of organizational characteristics is the most effective factor if factors such as individual-personality characteristics and communication-social characteristics have both effectiveness and effectiveness, as well as team-collective characteristics and technical-professional characteristics among the mentioned factors, only It is effective in determining the levels of effectiveness of the proposed indigenous model, practical suggestions were provided to address the challenges.

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## 1. Introduction

Individuals join an organization in order to satisfy and fulfill their individual goals. They achieve goals that one person alone cannot achieve by helping and participating in organizations. Humans have needed cooperation and participation in all matters, and in our country, due to the development of management science and the establishment of new management in organizations and institutions, the issue of participation in management has received much attention today (Salajeghe, Honaramuz, 2010).

The most fundamental and important task of the manager of any organization is to make decisions at all levels of the organization. In fact, organizations ultimately depend on the conditions and outcome of the decisions of managers. In order to make effective use of human resources and tools and other organizational resources, the decision of the manager is necessary because every manager always tries to activate the highest efficiency of the tools and resources of the organization to achieve the designed goals of the organization. In the decision-making chain, education, information and personal experience of the manager are not enough; therefore, managers have used different methods, different management methods, different decision patterns and many consultants to be able to achieve their appropriate criteria and goals of the organization (Afshani, Nourian, Hosseini Ramsheh, 2005). As mentioned, one of the most important issues in management is the issue of individual differences in the type of decision making. Researchers and thinkers in management sciences have disagreed on the order of important activities of individuals, but do not doubt that one of the most basic tasks of individuals and managers is to make appropriate and timely decisions (Alvani, 2006).

The status and decision-making ability of educational administrators in education and schools has an undeniable role because many researchers and thinkers believe that decision-making is the basis of management and good decision-making leads to acceptable returns. Therefore, the importance of decision-making in educational institutions is not hidden from anyone because these institutions interact with individuals and human beings and their educational decisions affect the fate of individuals and if decisions are not made well, it will cause catastrophic losses for people in society (Shakerian, et al, 2019).

When participation is organized in the organization, all people consider themselves respected, valuable and effective, and consider themselves partners in the results and the end of the organization, and will feel more committed in relation to the organization. Therefore, the intervention and participation of individuals in the decisions of the organization and the use of their ideas and opinions in a practical way increases the sense of responsibility and commitment in relation to the decisions that are made in the organization. Therefore, managers should involve people to move forward in the activities of the organization, considering their ability and capability in decision-making, and respect their opinions about organizational challenges and problems in order to increase their commitment. Committed employees improve the effectiveness of the organization and are more productive than other employees and less inclined to leave the organization (Morrow et al., 2012).

In fact, if the supervisors and managers do not consider the decision-making ability of the people of the organization and do not consider them worthy of this job, the individuals and employees do not show interest in participating and on the other hand, supervisors and managers of the organization The efforts of individuals and employees become useless, this causes an emotional rupture between employees and the organization and mentally disconnects from the organization and will lead to a definite emotional separation between individuals and the organization. Educational institutions deal with the issue of decision-making in relation to challenges such as students, teachers, teachers, academic work, confrontations and conflicts, and the scope of this issue is penetrated at different levels of educational management and finally the decision-making of educational administrators is the end of a society. It is unfortunate that a number of principals, teachers and educators, due to lack of knowledge or reliance on the fact that the education system is a centralized and centralized system and the plans, books, content and topics of the courses have already been determined, have a serious task to do inside school. They do not believe in themselves and spend most of

their time on the daily implementation of bylaws, instructions and directives, while principals, teachers and educators should be aware that even if the same books, people are notified in advance, the plans are set. And … there is, but the main activity of education should take place inside the classrooms and naturally in the school. The results of the present study to design a model of teachers' participation in decision-making can: Help education administrators and school-based education administrators to use the ideas, opinions and suggestions of teachers to deal with Prepare for challenges, problems, conflicts, etc. and choose the best solution, Using teachers' opinions and opinions in decision-making increases their motivation and desire to cooperate. Due to the fact that teachers and teachers spend most of their time with students, teachers' participation in decision-making is able to provide safer solutions to involve parents in school goals, help them understand school problems, etc. Based on research, Teachers' participation in decision-making increases their motivation and enthusiasm for their job and can reduce job fatigue, conflict and job stress and cause value, self-confidence, etc. among them. In this research, first, the indicators (criteria) and sub-indicators of teachers' participatory decision-making have been identified. After determining and identifying the indicators and sub-indicators, first the effectiveness and effectiveness of the criteria on each other has been investigated. Due to the multiplicity of indicators, multiplicity of capabilities, complexity of decisions, appropriate and scientific approach to ambiguity and inherent uncertainty of such studies, as well as the internal effect of components, the method of combining the Demetel method and interpretive structural modeling (ISM) will be considered. In this regard, first, based on the opinion of experts, using the ISM method, the criteria were identified and then the relationships between the criteria were determined.

## 2. Methodology

This research was an applied research and in terms of data collection was descriptive-correlational. The 10th grade was given by the teachers of the second year of secondary education in Lorestan province in the 2019-20 academic years. The statistical sample was selected using purposive sampling from among 30 individuals who had at least 10 years of research or executive experience. In order to conduct the interview and identify the indicators and sub-indicators, the snowball sampling technique was used (finding one case and using it to find the rest). This technique is a method that requires consultation with people with information in a particular field in order to obtain appropriate items with the research. In the snowball method, we continue to collect information until we reach the saturation point; In fact, the sampling process continues until the experts participating in the research do not have a new agent to present and the answers are repeated exactly. In this case, sampling has reached theoretical saturation. In the present study, 18 theoretical saturations occurred in the interview. In order to collect information, library (documentary) and field (questionnaire) methods have been used.

A) Library method: In this study, the factors affecting teachers' participatory decision making (indicators and sub-indicators) were identified using books, dissertations, articles and databases related to the research topic (internal and external).

B) Field method: In order to determine the internal relationship between indicators using Demetel method and also model design and determine the levels of indicators and sub-indicators or using IS method, it is necessary to collect the opinion of experts based on a standard questionnaire. It is mentioned in two ways. In this regard, the mentioned questionnaires corresponding to the indicators and sub-indices identified in the research were designed and distributed among the statistical sample. The collected data were used as input of Demetel and ISM methods (Figure 1). It is also worth mentioning that two methods, Dimtel and ISM, were implemented in MATLAB software.

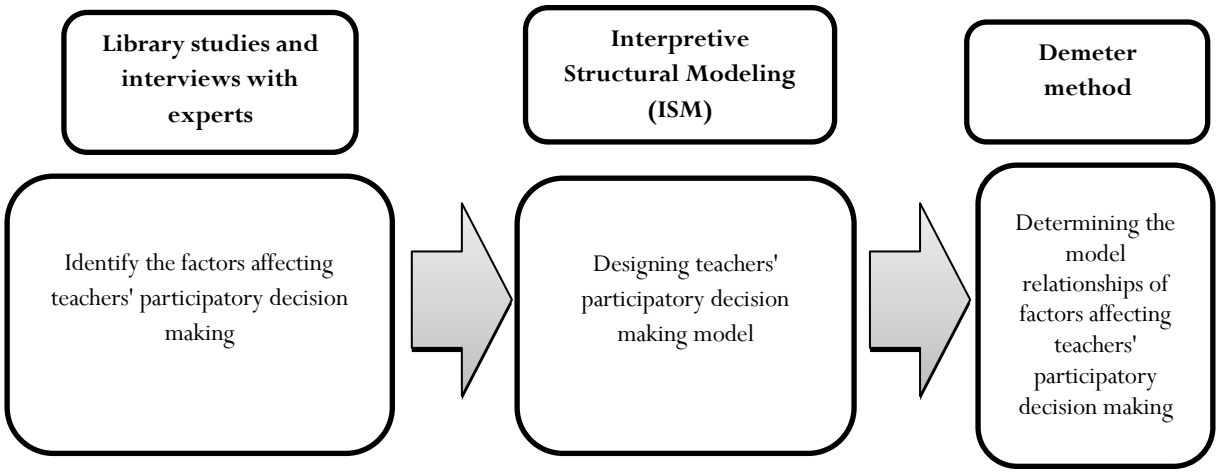


**Figure1.** Designing teachers' participatory decision making model

In the late 1950s, a research paper was presented by the Rand Institute on the scientific study of the opinions of experts in the Delphi technique army defense project. However, for security reasons, this technique was not introduced for more than ten years and was introduced in 1963 by Helmer and Duckley (Raut, Narkhede, Gardas, 2017). Its first civilian use was also proposed in economic development planning. Among the various features of the Delphi technique, its four features are almost always fixed. These characteristics include anonymity, repetition, controlled feedback, and statistical reporting of results (Förster & Gracht, 2014: 8). The Delphi technique aims to achieve a group consensus based on experts' views through questionnaires with feedback. With this process, experts can identify, classify and prioritize issues and develop a framework for forecasting. In the Delphi technique, the principle of anonymity is used to solve the complication of the intellectual group. In the Delphi technique, the experts and people used in the survey do not know each other. Anonymity guarantees overcoming the obstacles of the intellectual group.

The expert opinion is collected by a coordinator and then a summary of the results is shared by the coordinator with the other members. Then, based on the summary of the results of the previous stage, people modify and present their views again. Finally, after reaching a general consensus, the results are presented in the form of a statistical report (usually average or median) and used for decision making (Antcliff, et al, 2007). The main weakness of Delphi is the lack of a theoretical framework. Habibi et al. (2014) based on previous studies have provided a framework for using the Delphi technique in qualitative decision making. Based on this framework, selecting qualified members for the Delphi panel is the first step in implementing the Delphi technique. The validity of the results depends on the competence and knowledge of the panel members. Although there is disagreement about the composition and volume of the Delphi technique panel, a template pattern can be identified. Regarding the composition of the panel, it is better to use a combination of people with different specialties. The snowball technique can be used to select such a sample. In this method, the researcher first identifies eligible people and after receiving information, asks them to introduce the person or other people to him. Hogarth (1978) believes that six to 12 members is ideal for the Delphi technique, and according to Clayton (1997) between 5 and 10 members is sufficient if a combination of experts with different specialties is used. Although some Delphi studies included less than 10 members in their panels, other studies included more than 100 participants (Kelly and Porock, 2005).

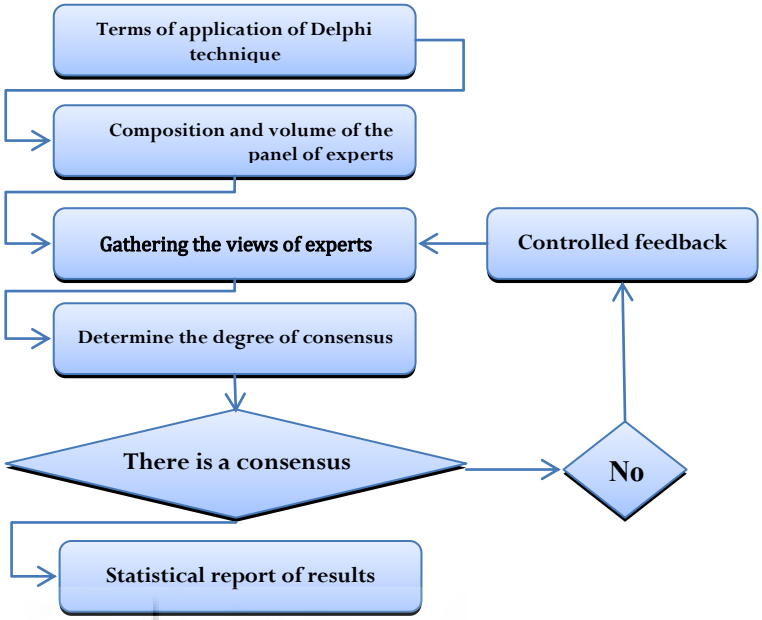


**Figure2.** Theoretical framework of Delphi technique in qualitative research

Different types of Likert spectra can be easily used to gather expert opinion. After collecting the views of experts, the average score of their opinions on each dimension is calculated. According to the theoretical framework, if there is no agreement, the calculated average will be provided to the experts as controlled feedback along with a re-questionnaire. After different rounds when the consensus is reached, the items are screened based on the average of the final round. Various methods have been proposed in various studies to determine the degree of consensus. Von der Gracht, in a 2012 study, presented 15 ways to reach a consensus based on a study of 114 articles on the Delphi technique. Kendall's coordination coefficient can be used to determine the degree of unity of opinion (Wonder Grachet, 2012). Interpretive Structural Modeling (ISM): The ISM method has been used for this research. This method is an interactive learning process in which a set of different and interrelated elements are structured in a comprehensive systematic model. This methodology helps to create and direct complex relationships between the elements of a system. The different stages are as follows (Azar, Khosravani, Jalali, 2013).

Step 1: The criteria or elements are listed. Step 2: Using the criteria or variables identified in the first step, a content relationship between them is defined according to each pair of criteria. Content relationship means a conceptual relationship between the components of the system, in a way that is semantically and content-wise appropriate to the goals of the system. . Step 4: The access matrix is developed using the self-interactive structural matrix and the transience of the matrix is checked. Content relation violation is a basic hypothesis in interpretive structural modeling. Violation means that if the variable "a" is related to the variable "b" and the variable "b" is also related to the variable "c", then the variable "a" is also related to the variable "c". Step 5: The access matrix in the fourth step, it is divided into different levels. Step 6: Based on the relationships defined in the access matrix, a directional graph is drawn and the abuse relationships are eliminated. Step 7: The final diagram is transformed into an interpretive structural modeling by substituting the names of variables or criteria instead of nodes. Step 8: The interpretive structural modeling developed in step 7 is reviewed to There is no incompatibility in terms of content, if there is incompatibility, the necessary corrections will be made (Azar, Khosravani, Jalali, 2013: 115).

## 3. Findings

Structural Self-Interaction Matrix (SSIM): Interpretive structural modeling suggests that expert opinions based on various management techniques be used to develop content relationships between variables. As a result, in this research, the opinion of 18 experts has been used to determine the content relations. 4 of these people were university professors in the field of management and the rest were experts and teachers of the second year of secondary education in Lorestan province. Experts were asked about each pair of criteria to comment on the relationship between the two criteria. Four signs have been used to show the relationship between the two criteria (i, j) (Azar, Khosravani, Jalali, 2013: 119).

V: If only the criterion i affects the criterion j.

A: If only the criterion j affects the criterion j.

X: If both criteria i and j affect each other.

O: If there is no effective relationship between the two criteria i and j.

Initial access matrix: The structural self-interaction matrix becomes the zero and one matrix, which is called the initial access matrix. In this matrix there are only numbers zero and one (azar, Memariani, 1995).

V ~ (i,j)=1 and (j,i)=0

A ~ (i,j)=0 and (j,i)=1

X ~ (i,j)=1 and (j,i)=1

O ~ (i,j)=0 and (j,i)=0

We denote the initial access matrix by D. The final access matrix for the criteria is determined by applying an interaction relationship between the variables. For this purpose, first using the initial access matrix D, we form the M matrix with the following relation.

$$\boldsymbol{M = D + I} \quad (1)$$

Which (I) is the same matrix. Next, in order to determine the final access matrix, we increase the matrix M to the power until the following relation is established (the matrix that has reached the power is equal to the previous matrix).

$$\boldsymbol{M^{k} = M^{k+1}, k > 1} \quad (2)$$

We stop when we obtain the first power of the matrix M with relation (2). The matrix is the product of the final access matrix (M ^ *). In the final matrix, the result of the number 1s in the row corresponding to a criterion, in fact, represents the lines or effects that result from that criterion on other criteria. Also, the number of 1s in the column corresponding to the mentioned criterion indicates the effects that are placed on that criterion. Each of the criteria has two sets of access and priority, which are extracted using the final access matrix. Access set (total output): For each criterion i: includes the criteria that criterion i affects; In addition to the criterion i. (Criteria that are one in the row corresponding to the i-th criterion in the final access matrix of their corresponding number) Introductory set (input sum): For each criterion i: contains the criteria that affect the element i; Plus the element itself i. (Criteria that are one in the column corresponding to the i-th criterion in the final access matrix of their corresponding number) Subscription set for each element i: The share between the access set and the first. The leveling of factors is such that any element that has the same set of accessibility and commonality is placed in the first level. The element is then removed from the set of factors and this process is done for other factors to level all the factors. After determining the access set and the initial set for each of the criteria and determining the common set, the leveling of the criteria is done. Criteria in which a common set is equal to the access set of that criterion occupy the first level of priority. By removing these criteria and repeating this process for other criteria, the levels of other criteria are also determined. Finally, after determining all the criteria, a diagram is drawn. Numerous decisions in organizations as well as decision-making models, in order to solve or improve their desired problems, need to be assumed options,

solutions and indicators and quantitative and qualitative decision-making criteria. . Demeter's method derives the influence and interaction of the relations between the elements using graph theory and shows the scores with a number. This method uses relationship feedback. This means that each element can affect and be influenced by other elements at equal, higher and lower levels. In order to implement the Demetel method and after determining the experts, the following steps are taken. Step 1: Identify the components of the system.

In the first step of this method, a list of existing and effective factors in the problem under the opinion of the expert group should be extracted with the help of one of the methods of creating ideas in experts. Among the ideation methods used to gather the factors affecting the problem, we can mention the method of brainstorming, writing, group S, Delphi or conference (Ahmadi, Nasiriani, Abazari, 2008). ). It is certain that it will be possible to achieve a comprehensive dimension of the issue by polling more experts, but the number of members of the expert group has been announced in some sources as 10 to 12. However, it should be noted that the quality of experts' opinions and the scope of their insights are extremely important and the degree of individual perception of experts on the existence and how the relationship between the elements in the issue under consideration is effective in the final structure of the system. In the second step, first, according to the number of factors identified in the first step, for example, N factor, the square matrix N × N is drawn, where each row is identified corresponding to a factor. Also, similarly, each of the matrix columns (in the order of the factors in the rows) corresponding to the factors has been identified. This matrix is called the direct connection matrix, which is denoted by R. Next, each direct matrix element (r_ij) corresponds to the effect of the i-th row criterion on the j-th column criterion, which, using the opinion of each of the experts, will be completed with a number from zero to 4 based on Table 1 ( Ataiee, 2010). The direct communication matrix is completed by several experts (statistical sample). Finally, using the simple mean of the views, a direct correlation matrix (R) is formed to apply the next steps of the Demitel method. The degree of influence of demitel scales is scored from 0 to 4 with ineffective values to very high effect, respectively. In order to normalize the direct communication matrix; after determining the direct correlation matrix of the criteria using the opinion of experts, the said matrix should be normalized. In the next step, the complete correlation matrix was calculated. Each of these factors (corresponding to each factor) indicates the extent to which that factor affects other factors. Then, we calculate the sum of the elements of each column of the T matrix. The vector of all rows is named T_2. Each of these factors (corresponding to each factor) indicates the degree of influence of that factor from other factors (the degree of influence of variables). Next, with the values of T_1 and T_2, we calculate the following vectors. The horizontal vector (T_1 + T_2) is the amount of influence of the desired factor in the system. In other words, the higher the value of T_1 + T_2 factor, the more it interacts with other system factors, Vertical vector (T_1-T_2) that represents the influence of each factor. In general, if T_1-T_2 is positive, the variable is a causal variable, and if it is negative, it is a disability. Finally, a Cartesian coordinate system is drawn. In this device, the longitudinal axis is T_1 + T_2 and the transverse axis is based on T_1-T_2. The position of each factor is determined by a point with coordinates (T_1 + T_2, T_1-T_2) in the device. In this way, a graphic diagram will be obtained. To determine the network relationship map (NRM), the threshold must be calculated. In this regard, the mean of the matrix relations (T) is considered as the threshold. Next, in order to plot the relationships between the criteria, we set the value of each T-matrix that is less than the threshold to zero and one that is higher than the threshold to one. In the resulting matrix, each of the items in the matrix element represents the effect of the row element on the column corresponding to that element. According to this matrix, the network model is drawn between the criteria. In this section, the effective factors on teachers' participatory decision making with Delphi method are discussed. Step 1: Problem statement and feasibility study of Delphi method were approved according to the research problem. Step 2: Identify and select members of the panel of experts: There are people who have complete mastery in identifying and ranking

the factors affecting the participatory decision-making of teachers who were identified by snowball sampling. In order to compile a preliminary questionnaire and test it in a pilot study, first, using a study of research literature, a list of factors affecting teachers' participatory decision-making was identified. Then an initial screening was performed and duplicate or synonymous indicators were removed, and finally the following indicators were identified.

**Table1.** Indicators and sub-indexes extracted initially based on library studies

| Row | Indicator | Subscript |
|---|---|---|
| 1 | Individual | Willingness to participate, self-confidence, perseverance and patience, motivation for continuous improvement, knowledge, intellectual agility, innovation and creativity, listening, asking questions, admitting mistakes, attachment to the organization, commitment, quick decision making, service experience, level of education |
| 2 | Collective | Collective thinking, employee involvement in teamwork, the ability to interact, promote employee engagement, team composition, voluntary participation in affairs, adaptability, strengthening identity and collective goals, understanding individual differences, encouraging members to support and advocate Each other, positive and open presence in the group. |
| 3 | Organizational | Management style, defining the assumptions of the decision-making process, familiarity of senior managers with the goals of the partnership system, clear definition of goals, vision and organizational goals, defining the dimensions of partnership, partnership training, expectations from the implementation of the partnership system, strong and practical support of managers from the partnership system. Selection and appointment system, number of organizational levels, conflict management by managers, high organizational commitment, evaluation and feedback |
| 4 | Technical and specialized | Job Ability, Competence, Communication Skills, Decision Making Quality, Specialized Education, Knowledge Development |
| 5 | Structural | Participatory structure, hierarchical structure, structural flexibility, context, technologies, information sharing and sharing, information transfer, time required for participation, spatial factors of participation, monitoring and control |
| 6 | Environmental | Trust building, Adjusting environmental conditions, Non-discriminatory environment, Defining restrictions, Job freedom |
| 7 | Cultural | Creating a culture and creating a favorable environment for the implementation of the participation system, sufficient belief in the participation system, individual beliefs about the relationship between managerial power and their participation, creating a culture of teamwork, culture of criticism, supportive culture, adherence to values and norms |
| 8 | Economic | Managers believe in increasing benefits, benefits against disadvantages, reducing organizational costs due to participation, business factors, increasing productivity, organizational effectiveness, receiving rewards |
| 9 | Political | Belief in the sharing of managerial power, balance between managerial authority and staff authority, creating equal opportunities for all people, feeling fear and danger, explaining responsibilities, communication with government |
| 10 | social | Honesty, observance of justice in explaining possibilities, accepting responsibility, the right to decide one's own destiny, defending the equality of human beings, feeling the need, connecting with society |

After identifying the research indicators, a questionnaire was designed and research questions were prepared based on these indicators. After designing the initial questionnaire, all the indicators or factors identified by the group members were examined and an appropriate and understandable equivalent was used for each of these indicators. Then, the designed questionnaire of the first round was sent to the experts. After collecting the completed questionnaires of the first round, the average opinion of experts was calculated and analyzed based on the opinions of experts and the average opinions of experts. In this study, based on the opinions of experts, indicators (questions) whose average value is more than the average value of the spectrum (which is equal to the number 3), as important indicators and less than 3 as low indicators They are recognized as important.

According to the mean value obtained for each of the research questions, it was observed that among the questions (index) of the first questionnaire, two questions have an average value less than the mean value of the spectrum (ie number 3), so these questions (indicators) ) Were considered as trivial questions and were

ignored. Experts also introduced two new indicators in their questionnaires. According to the results obtained from the analysis of the first questionnaire, the second questionnaire was designed. To design the second questionnaire, the questions that were considered insignificant in the first questionnaire were removed from the questionnaire and on the other hand, two new questions were designed and added to the questionnaire for two new criteria introduced by the experts. The redesigned questionnaire was sent to the experts. Also, the general results obtained from the first round questionnaire were provided to the experts. According to the analysis of the questionnaires collected in the second round, the average of all indicators (questions) is higher than the average value of the spectrum (3). Therefore, all the introduced indicators are effective factors on teachers' participatory decision-making and no new indicators were suggested by experts. Therefore, in the end, the effective factors on teachers' participatory decision-making were selected.

**Table2.** Components and characteristics extracted after the Delphi stages

| Indicator | characteristics | Indicator | characteristics |
|---|---|---|---|
| Individual-personality traits | Self-actualization | Organizational characteristics | Clear definition of common goals |
| | Self Confidence | | Explain responsibilities in partnership |
| | Hardiness and patience | | Existence of participation |
| | Acceptance of responsibility | | Existence of delegation of authority |
| | Decision making knowledge | | Existence of an incentive system for participation |
| | Interest and honesty in teamwork | | Existence of a system of punishment for non-participation |
| | Criticism of | | Expectations and expectations from the implementation of the participatory system |
| | Field and level of education | | Information sharing |
| | Feeling the need to participate | | Creating equal opportunities for all |
| | Paying attention to the needs of students | | Evaluation and feedback |
| | Commitment and attachment to the organization | | Existence of behavior monitoring and control system |
| | Interest in organizational growth and development | | Belief in power sharing |
| | Innovation and creativity | | How to interpret decisions |
| Team-collective characteristics | Intimacy and empathy | | Conflict management |
| | Believing in the abilities of others | | Explain the assumptions of the decision-making process |
| | Adequate belief in participatory decision making | | The context of the balance between the authority of the manager and the authority of the employees |
| | The importance of collective thought and reasoning | | Explain the reduction of costs due to participation |
| | Getting involved in teamwork | | Explain the increase in productivity through participation |
| | Strengthen identity and collective goals | | Strong and practical support of managers for participation |
| | Encouragement to support and support each other | | Existence of participatory structure |
| Communication-social characteristics | Ability to connect with the community | | Partnership technologies |
| | Ability to listen | | Creating a platform for participation |

| | | | |
|---|---|---|---|
| | Ability to ask questions | | Spatial factors of participation |
| | Ability to interact | | Adjust environmental conditions for participation |
| | Voluntary participation in affairs | | Time required to participate |
| | Compatibility | | Ability to use brainstorming |
| | Ability to understand individual differences | | Ability to recognize and increase knowledge |
| | Observance of values and norms | Technical-specialized features | Ability to provide service experience |
| | | | Ability to develop competency |
| | | | Ability to make rational decisions |

The main purpose of this study is to design a managers' participatory decision model based on interpretive structural modeling (ISM).The modeling process is described in six steps and the findings of each stage are expressed separately. The adjacent matrix contains the necessary information about the components, the relationships between them. This matrix is shown in Table (3).

**Table3.** Structural self-interaction matrix for factors

| | Individual - personality | Team-collective | Communication - Social | Organizational | Technical-specialized |
|---|---|---|---|---|---|
| Individual-personality traits (C1) | | V | V | A | V |
| Team-collective characteristics (C2) | | | A | A | O |
| Communication-social characteristics (C3) | | | | A | O |
| Organizational Characteristics (C4) | | | | | V |
| Technical-specialized characteristics (C5) | | | | | |

In the next step, based on the information obtained, the initial access matrix was checked. For this purpose, by placing the corresponding numbers of each symbol as follows in the matrix obtained from the previous step, the initial access matrix was formed. In the next step, we calculate the final access matrix. For this purpose, we enable the initial access matrix until it is equal to the matrix before it. Calculations were performed in MATLAB software. The result of the calculations, which is actually the final access matrix

In this section, first, according to the final access matrix, we form the first periodic table. For this purpose, for each of the factors (individual-personality characteristics with symbol 1, team-collective characteristics with symbol 2, communication-social characteristics with symbol 3, organizational characteristics with symbol 4 and technical-professional characteristics with symbol 5) access set, introduction And determine the commonality of the two sets. For example, the access set of a variable with the symbol 1, which indicates individual-personality traits, are actually factors that have a value of the number 1 in the row related to the variable with the symbol 1, which according to the access matrix because in the first row all Except for one, the rest are equal to one.

Therefore, the access sets of the mentioned agent are {1, 2, 3, 5}. Also, the preceding set of the variable with the symbol 1 are in fact the factors that have the value of the number 1 in the column related to the variable with the symbol 1. After completing the first periodic table, any element that has the same set of accessibility and subscriptions will be placed at level 1.

**Table4.** First periodic table

| Variable | Access set | Introduction Collection | Subscription | Level |
|---|---|---|---|---|
| **1** | 5,1,2,3 | 4،1 | 1 | - |
| **2** | 1 | 4،3،2،1 | 1 | 1 |
| **3** | 2،3 | 4،3،1 | 3 | - |
| **4** | 1،2،3،4،5 | 4 | 4 | - |
| **5** | 5 | 5،4،1 | 5 | 1 |

According to the results of the first periodic table (Table 7), the variables of team-collective characteristics and technical-specialized characteristics were in the first level. After determining the first level factors, we remove the row and column corresponding to the factors located in this level from the final access matrix and form the second periodic table corresponding to the new final access. In order to continue the ISM process, the final access matrix of the two variables row and column whose level was specified was removed. In the next step, according to the resulting matrix, the second periodic table was formed. According to the results, the variable of socio-communication characteristics was in the second level. In order to continue the ISM process, the final access row and column of the mentioned variable (whose level was specified) was removed from the matrix. In the next step, according to the resulting matrix, the third periodic table was formed. In the third periodic table, the variables of individual-personality traits were placed in the third level. By removing the mentioned variable from the access matrix, only one organizational characteristics variable remains, which is also in the fourth level, and by identifying the levels of the four variables, the ISM model for the main variables was determined.

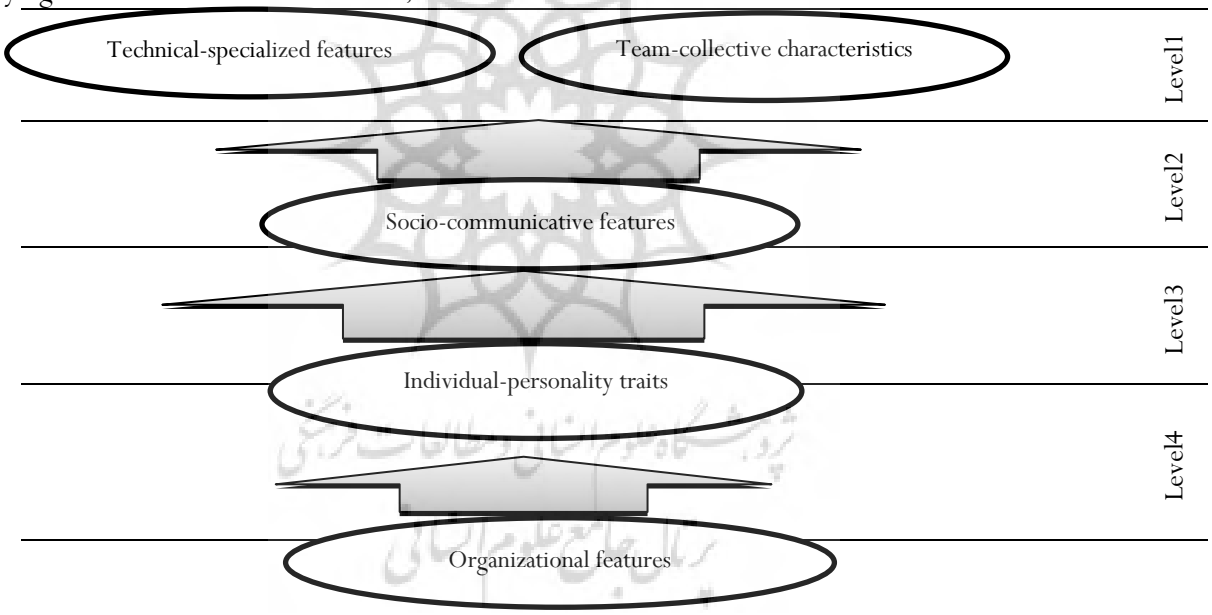


**Figure3.** Leveling the indicators of teachers' participatory decision-making model with ISM

According to the results of leveling the factors studied using ISM method, the factor of organizational characteristics is the most effective factor, while factors such as individual-personality characteristics and communication-social characteristics have effectiveness and effectiveness, as well as team characteristics. Collective and technical-specialized characteristics among the four mentioned criteria are only effective (Figure 2). The resulting relationships have been used for teachers' participatory decision-making model. After holding meetings and determining the indicators and sub-indicators, we examine the relationships of the main criteria using Demetel. Findings of the study Based on the Dimtel questionnaire to evaluate the effect of each factor on each other based on the opinions of experts and teachers of the second year of secondary education in Lorestan province as a primary matrix of direct relationship that the average opinions of experts on the impact of each The indices in the row are used on the indices in the column as

the input of the Demitel method. In the next step, using the normalized direct communication matrix, the total communication matrix was calculated in MATLAB software.

**Table5.** Communication matrix (T)

| | Individual - personality | Team-collective | Communication - Social | Organizational | Technical-specialized |
|---|---|---|---|---|---|
| Individual-personality traits (C1) | . | 0/217 | 0/264 | 0 | . |
| Team-collective characteristics (C2) | 0/129 | 0/302 | 0 | 0/323 | 0/129 |
| Communication-social characteristics (C3) | 0 | 0 | 0/177 | 0/112 | 0 |
| Organizational Characteristics (C4) | . | 0/217 | 0/264 | 0 | . |
| Technical-specialized characteristics (C5) | 0/129 | 0/302 | 0 | 0/323 | 0/129 |
| threshold | | | 0/145 | | |

According to the results, factors such as organizational characteristics and technical-specialized characteristics were identified as effective factors by obtaining positive values for T_1-T_2 and individual-personality characteristics and team-collective characteristics were identified as effective factors by obtaining negative values.

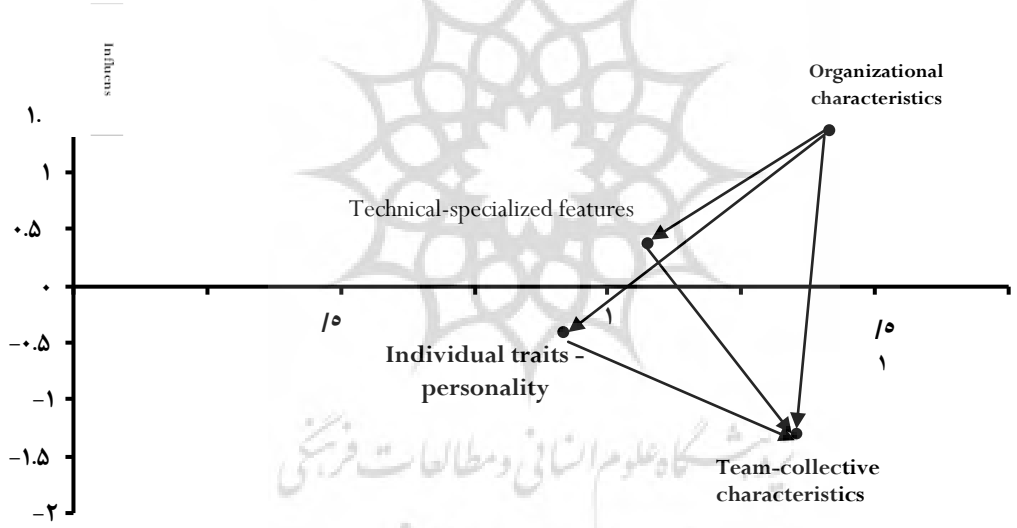


**Figure4**. Cause and effect relationships of criteria

Then the mean of the T matrix, which was equal to 0.145, was considered as the threshold. Then the values of the matrix T, the value of which was less than the threshold (0.145), was equal to zero and if it was larger than the threshold, it was set to one. Finally, by considering the numbers one in the relationships of the relationship matrix, which indicates the relationship between two components such as that knowledge, the network relations map of the main criteria was drawn.

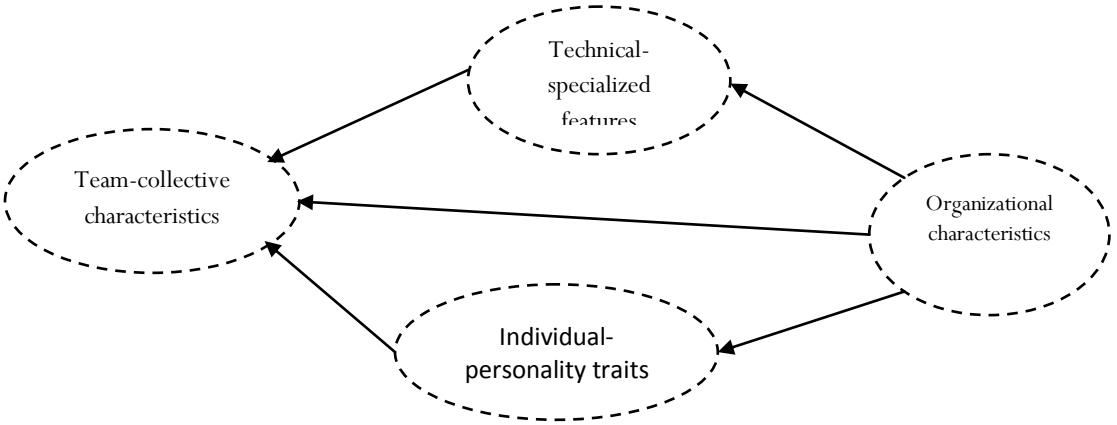


**Figure5.** Mapping the effect of the relationship between the indicators of the second year of secondary education in Lorestan province and Demetel

## 4. Discussion

In general, it can be said that participatory decision making is a multi-faceted concept. A review of the participation literature shows that some organizational theorists and researchers have considered the dimensions of participation, but most past empirical research has assumed that participation is a one-dimensional concept. Research shows that employee participation in decision making has many benefits that can be directly or indirectly effective in achieving organizational goals. Considering that research in the field of participatory decision making and the benefits of using it in most countries of the world as well as Iran has been in the spotlight over the past few years and employees and members have been mentioned as an important factor in the organization, but still There are many organizations in the country that use non-participatory methods in their decision-making and management style. To this end, we tried to consider the role of participatory decision making as an applied strategy that can solve the basic problems of the organization. Is. This article aimed to illustrate the dimensions of participation according to the research proposal and the opinion of experts, to provide a model and to consider the possible effects of these dimensions on the success of decision making, In other words, a combination of these dimensions and components, different design and structural pattern. A review of the partnership literature has shown that we have not yet reached a comprehensive theory or even an accurate understanding of the relationships between the structural dimensions of partnership and its effectiveness.

The first dimension is the realm of participation, which covers decision-making issues. These topics, components and dimensions are classified in different ways. Areas of participation may include: technical matters, manpower, physical working conditions, and policy-making, etc. Some researchers have divided these issues into two general categories: strategic decisions and tactical decisions. Participation in both types of decision-making can have positive effects, but it seems to have a strong effect on strong tactical decision-making. The basis of participation as another dimension of participation refers to how to form a participatory system in an organization. Structural (formal) or interpersonal (informal) relationships occur. Formal participation refers to a system in which regulations explicitly define decision-making procedures, while informal participation is seen as a leadership style and is not defined within the framework of organizational regulations. Organizational lack of commitment, negative attitude towards job and organization, job dissatisfaction, emotional and psychological damage to employees and reduce job performance and leads to improved attitude, feelings and job performance of employees are also examined. Therefore, after library studies, 60 indicators were extracted, which after factor analysis and expert approval were in the form of 9 main factors or variables. Then the measurement models were analyzed by the software to confirm the accuracy of the latent variables and the overall structural model and research hypotheses, and the fit indices obtained values that indicated the acceptability of the model. Also, the findings obtained from the standard estimation of path coefficients showed that the hypothesis was

confirmed. The findings also showed that although participatory decision making does not directly affect the job performance of employees, but it does affect the performance by creating job attitudes and positive emotions. In this section, it is necessary to compare the findings obtained in this study with the results of other similar studies to testify to the accuracy of the findings of the present study.

Findings from a previous study found that involving people in organizational affairs and decision-making leads to satisfying high needs such as self-confidence, respect, self-fulfillment, and achieving participatory and supportive acceptance, leading to positive employee feelings and emotions. . Some researchers have argued that participatory decision-making has no effect on performance; But others believed that participatory decision-making had a significant effect on performance. In this section, a similar finding and an opposite finding to the present study are presented. The results of one study showed that participatory decision-making had a positive effect on drama. In another study, which recently had an acceptable level of performance, the researchers concluded that the use of participatory and relationship-oriented style by managers directly affects performance does not have.

In line with the fourth finding of the present study, there are two similar findings. The empirical implication of a previous study was that researchers believed that there was a strategy that would motivate people and improve their efforts, thereby enhancing their professional and personal performance. They believed that strategy was participatory decision making. Because by definition, they defined participatory decision making as a motivational outcome program to improve job performance. In general, it can be argued that the special feature of this research was its comprehensiveness compared to previous researches.

Finally, it is recommended to organizations such as education that seek sustainable growth and development and gain a competitive advantage among schools: the knowledge of their principals; In particular, raise the level of managers who use traditional styles in their organizations by teaching new and up-to-date management approaches, Because new management styles emphasize participatory and group decision making in the organization. Identify employees who have the necessary skills of intelligence, technical knowledge and human relations and participate effectively in matters such as decision making and setting organizational goals. Environment and structure and provide organizational culture in such a way that people can express their creative and innovative ideas freely and without fear of rejection or failure. Provide a facilitating space for cooperation, communication and mutual trust in their organization so that people can Easily share their knowledge with other members. Implement support and encouragement strategies for new ideas in the organization; In such a way that school principals should behave in a way that encourages silent and inactive people to enter into group discussions, and in this way, they should not reject the solutions offered and their expressions in the first place. In this way, we can provide the ground for changing people's attitudes toward their jobs and their organization in a positive direction, and pave the way for improving employees' feelings and ultimately improving their job performance.

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