



Learning Organization Model in Agricultural Cooperatives of Iran: A Two-Step Approach to SEM Based on DLOQ

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Received: 25 September 2021,

Accepted: 13 June 2022

Abstract

The purpose of this study was to design a learning organization model for agricultural cooperatives (ACs) in Iran. To conduct this study, a survey research method was employed, with stratified random sampling as the chosen sampling method. The primary tool used in the research was the Dimensions of Learning Organization Questionnaire (DLOQ), a standard assessment questionnaire for evaluating learning organizations. Structural equation modeling (SEM) was applied to analyze the collected data. A two-step approach to SEM was used to assess the measurement model and design the structural model. The results revealed that the status of cooperative organizations in Iran did not align with the indicators of a learning organization (LO) and highlighted the need for a model to facilitate the adaptation of cooperatives towards becoming learning organizations. The proposed model identified the most critical dimensions of LO compatibility with cooperatives and the factors influencing them. Cooperative stakeholders can utilize this model to guide their adaptation towards becoming learning organizations in their respective fields of work. This research contributes to the existing literature by offering a model that is tailored to the unique context of cooperatives aiming to become learning organizations.

Keywords:

Agricultural cooperatives; DLOQ; learning organization; structural equation modeling

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INTRODUCTION

Economic complexity offers a potentially powerful paradigm for understanding the key social issues and challenges of our time (Balland et al., 2022). In today's turbulent business environment, most entrepreneurs fail when starting a business. Even long-established organizations have faced failure due to a lack of focus on continuous learning. Traditional organizational structures have proven ineffective in managing today's dynamic organizations. Institutions striving to thrive in the current competitive landscape must be adaptable, flexible, and dynamic. They should prioritize enhancing the teaching and learning processes across all classes and departments within their institution. Their goal should be the transformation of their institution into a learning organization (LO) (Jensen, 2017).

A learning organization (LO) is an entity dedicated to increasing intellectual capital to enhance products or services for customers and secure the organization's assets for future development (Ghazali et al., 2015). Indeed, the only constant in life is change, and in the 21st century's knowledge-based economy, no one can afford to ignore the challenges posed by knowledge and organizational development (Liao et al., 2010). From a knowledge-based perspective, knowledge and learning within the learning organization are fundamental elements for fostering innovation, including sustainable innovations (Durst & Zieba, 2020). The term "learning organization" was coined approximately 40 years ago by learning scientists but was further developed and substantiated by Peter Singh (1990). He outlined strategies for achieving a learning organization, emphasizing three critical aspects: the ability to nurture aspirations, the capacity to build and foster collaborative and interactive communication, and the capability to comprehend interconnected relationships (Sachan et al., 2016). Therefore, a learning organization is an institution or organization that empowers individuals to work collectively toward a

common vision while fulfilling their respective responsibilities and duties (Celik et al., 2016). It equips organizations to not only survive in the competitive business environment but also gain a competitive advantage (Farrukh and Waheed, 2015).

To foster creativity, cultivate fresh perspectives, and encourage innovative practices, learning institutions and organizations employ flexible, goal-oriented, and program-based learning strategies (Serrat, 2017). A learning organization (LO) stands as an institution that guides all employees toward continuous learning, improvement, and empowerment (Allouzi et al., 2018). LOs embody a philosophy and commitment to generating sustainable solutions and results (Khunsoonthornkit and Panjakajornsak, 2018). There is compelling evidence that organizations embracing the concept of LO can achieve significant progress. The survival of modern public institutions hinges on their ability to embrace change, enhance performance, and remain competitive. An LO places paramount importance on facilitating learning among its members and possesses unique characteristics to adapt to the evolving environmental demands (Hussein et al., 2014).

An LO recognizes the value of flexible organizational memory. Such organizations create an environment in which individuals and teams employ diverse methods to acquire tacit knowledge and share it effectively through targeted and collaborative practices and policies (Serrat, 2017). While interpretations of the LO concept may vary, there is a general consensus that LOs are indispensable in navigating rapidly changing external environments. They are applicable to a wide range of organizations and represent the most sustainable competitive advantage for any organization, as they continually learn and enhance their capabilities (Pedler and Burgoyne, 2017; Kools et al., 2020).

A learning organization (LO) is a phenomenon in which learning and work are seamlessly integrated, supporting the continuous development of individuals, groups, and or-

ganizations. This definition suggests that individuals within a learning organization view learning as an ongoing, integral process, extracting lessons from every experience (Odor, 2018). By adopting the structure of an LO, organizations can make informed decisions, effectively manage learning and change processes, and maintain control over their actions. LOs offer numerous advantages to organizations, enhancing their dynamic knowledge renewal and learning capacity in pursuit of organizational goals (EGE et al., 2017). In essence, conceptualizing an LO differs significantly from actualizing one. This transformation is not a straightforward choice. When an organization commits to becoming an LO, it acknowledges the inevitability of disruptive change (Harris & Jones, 2018).

Disciplines of the Learning Organization

Senge (1990) developed the fifth discipline model through the Center for Organizational Learning at MIT's Sloan School of Management. Senge proposed that learning organizations (LOs) require five key disciplines: team learning, personal mastery, shared vision, mental models, and systems thinking (Park, 2008).

Personal mastery involves the efficient use of time, engaging in thoughtful activities, and applying personal efforts to gain and deepen insights (Whitbeck, 2014). The fundamental premise of personal mastery is that an organization can only learn if its members are committed to continuous learning. Personal mastery encompasses two fundamental aspects: firstly, the ongoing clarification of what is of utmost importance, and secondly, the perpetual enhancement of the ability to perceive the current reality more clearly (Stevens, 2019). It represents the capacity for individual growth, learning, and self-empowerment. This enables employees to delve deeper into their insights, concentrate on their objectives, and channel all their efforts into developing their personal and professional skills and capabilities (Garcia-Morales

et al., 2007). Personal mastery also positively influences a manager's ability to demonstrate effective leadership within the organization (Retna, 2011). It encompasses the discipline of continuously clarifying and deepening personal insights, focusing energy, cultivating patience, and objectively perceiving reality (Baby, 2016). In essence, personal mastery denotes an employee's self-discipline for personal learning and development (Yaslioglu et al., 2014).

Mental Models: Mental models are deeply ingrained perceptions, images, and internal constructs that shape our understanding of the world and influence our actions within it. Often, we may not be fully aware of the impact our mental models have on our performance (Mets & Torokoff, 2007). Differences in these mental models can sometimes lead to disagreements. Therefore, fostering an awareness of this diversity and promoting an understanding of various mental models enables individuals to freely express their perspectives while also accepting the mental frameworks of others, thus fostering a shared learning environment (Panagiotopoulos et al., 2018).

Shared Vision: A shared vision among a group of employees is born from a common organizational culture and serves to emphasize shared values, as well as convey the moral, ethical, scientific, and professional foundations of the profession (Fitzpatrick et al., 2019). A shared vision creates the conditions for employees to align their views in pursuit of the organization's common and future objectives (Theptheпа and Mitsufuji, 2016). It serves as the guiding principle for all activities within the organization (Liao et al., 2010).

Team Learning: Team learning is closely tied to competency-based training (Wijnia et al., 2016). The ability to learn and innovate is recognized as a crucial factor for employee teams to deliver high-quality performance (Timmermans et al., 2012). Team learning embodies a spirit of cooperation, collaboration, and the application of participatory

skills essential for effective teamwork (Yang et al., 2004). It contributes to enhancing group performance (Harms, 2015).

Systems Thinking: Systems thinking is an essential skill required to address the complex challenges facing society (Grohs et al., 2018). It serves as the foundational framework for visualizing the evolution of knowledge assets (Schiuma et al., 2012). Systems thinking entails a global and collective perspective, encompassing organizational perceptions (Antunes & Pinheiro, 2020).

Learning Organization Pyramid (LOP): Liao et al. (2010) introduced the Learning Organization Pyramid (LOP) model to understand the impact of learning organizations on future competition. The five disciplines of LOP are as follows:

Creating a Shared Vision: A shared vision represents the collective goals and aspirations of a network (Exposito-Langa et al., 2015). It serves as the guiding principle for all activities within the organization (Liao et al., 2010).

Mental Edge: From the highest levels to the lowest rungs of the organizational hierarchy, it is crucial to recognize that the path to outperforming competitors lies in continuous improvement, ongoing innovation, and the ability to adapt swiftly to changes in the market (Liao et al., 2010).

Business Operating System Software (BOSS): BOSS gathers data for problem-solving and decision-making through processes involving review, research and development, interaction, and marketing in task delivery. It creates conditions to align customer expectations with key processes and developments (Liao et al., 2010).

ISO 9000: ISO 9000 is employed to manage and ensure quality, enabling organizations to achieve quality documentation in line with international standards (Terziovski and Guerrero, 2014).

Learning Organization Library (LOL): LOL serves as a function-oriented database comprising repositories from various knowledge-based libraries. It caters to the needs of

day-to-day operations, research and development, marketing, production, and management (Liao et al., 2010).

Developing strategies aimed at designing new approaches to work and knowledge management is critical for organizations. The introduction of learning organizations should be regarded as a pivotal choice for enhancing knowledge management and fostering continuous professional development in practice (Caldwell, 2012).

Models of the learning organization

Various researchers have proposed different models for the learning organization concept. Phillips (2003) introduced a learning organization model that incorporates key characteristics, each interacting with the others. These characteristics encompass:

Emphasis on strategic thinking
improvement of decision-making processes
effective change management
leadership development focused on ideal qualities
attention to research and development
A culture of innovation
recognition of the value of intellectual capital and knowledge management.
In addition, the Organization for Economic Co-operation and Development (OECD) (2016) has put forth an integrated model known as "School as a Learning Organization." This model centers on:

Expanding and disseminating a vision centered on learning for all individuals
Creating and fostering sustainable learning environments for everyone
Developing systems for the acquisition and transfer of knowledge
Promoting learning from and with the environment
Cultivating a culture of learning leadership (Figure 1). These models provide valuable frameworks for organizations and educational institutions to promote learning and continuous improvement.

Serrat (2009) introduced a model of the learning organization (LO) that articulates its key components: organization, people, knowledge, and technology. In this model, knowledge and technology stand as crucial assets within a LO. LOs possess a keen awareness of

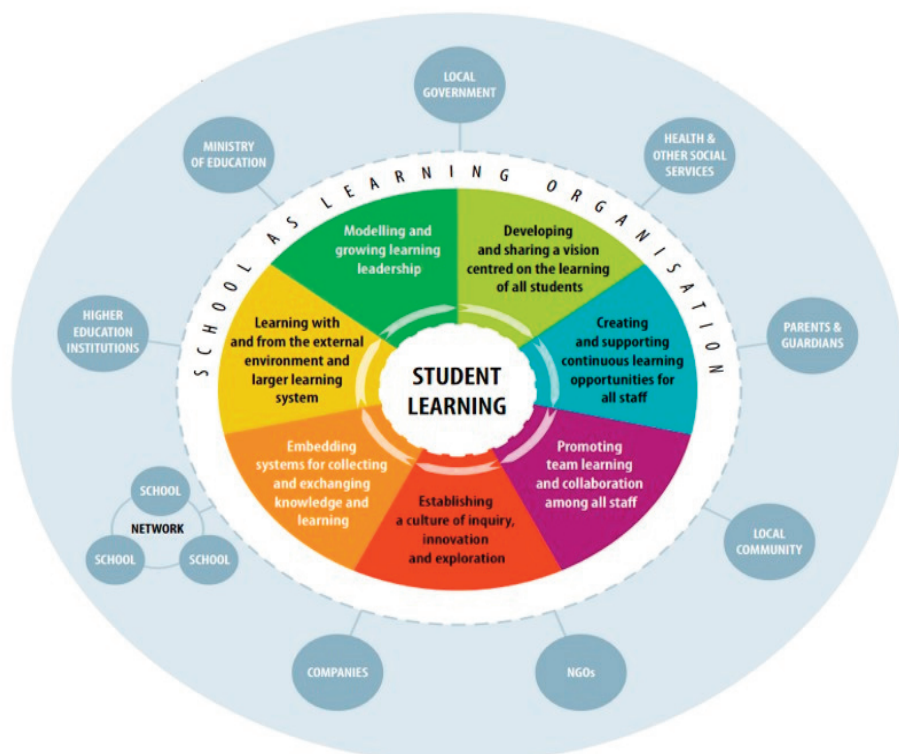


Figure 1. OECD Learning Organization Model (OECD, 2016)

how to harness the potential of information and communication technologies without compromising knowledge management and learning processes (Figure 2). According to a critical perspective on this model, Serrat emphasizes the significance of interactions between the organization, individuals, knowledge, and technology. It underscores the need to consider multiple relationships within this framework (Serrat, 2017).

In their paper, Liao et al. (2010) introduced an integrated model known as the “Learning Organization Pyramid (LOP)” (Figure 3) to facilitate internal knowledge management within organizations. This model encompasses the ESCAPE framework, which stands for Environment (E), Strategy (S), Capability/Competence (C), Advantage (A), Performance (P), and Evaluation (E). Liao et al. (2010) highlight three primary mechanisms within this model: The incorporation of the “fifth discipline” concept as proposed by Senge (1990, 1992). The implementation of Total Quality Management (TQM) practices, such as ISO 9000. Knowledge Management (KM) activities, which encompass knowledge creation, storage, sharing, and dissemina-

tion. From a critical perspective, one notable limitation of Liao et al.’s (2010) study is the reliance on the case study method rather than experimental testing. Additionally, it’s important to recognize that the ESCAPE concept is rooted in the authors’ real-world experiences in re-engineering the continuing education industry. Consequently, the applicability of this model may be more specific to a particular company project rather than broadly generalizable to all contexts.

Watkins and Marsick (1997) proposed an integrated model called the Dimensions of Learning Organization Questionnaire (DLOQ). Seven dimensions of LO culture are demonstrated in Figure 4. Song et al. (2009) stated that Watkins and Marsick proposed an integrated concept of learning organization based on three approaches: 1) for systems thinking, and organizational productivity (Senge, 1990); 2) for the learning perspective, comprehensive aspects of learning (Pedler et al., 1991); and 3) for strategic perspectives, management practices (Goh, 1998). DLOQ is a constructive concept of learning organization actions that have seven dimensions of learning-related factors in

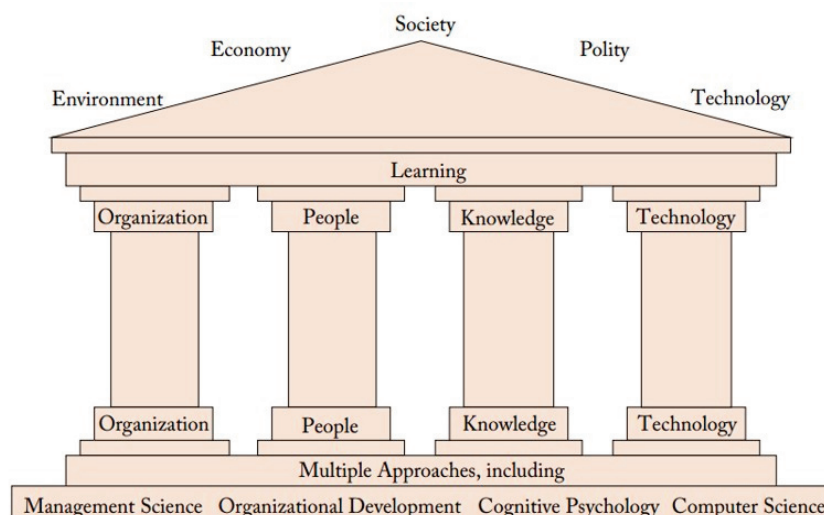


Figure 2. Serrat Learning Organization Model (Serrat, 2009)

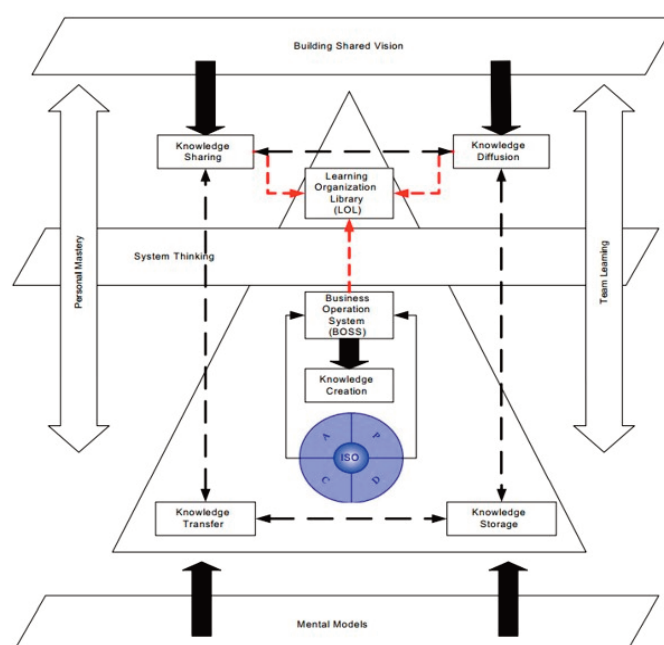


Figure 3. Liao Integrated Learning Organization Pyramid (LOP) Model (Liao et al, 2009)

both people-oriented aspects (continuous learning, inquiry, and dialogue, team learning, and empowerment) and structure-oriented (strategic leadership, system connection, embedded system) components (Song et al., 2009). The model of an effective learning organization is considered a model that can integrate individuals and organizational structures to facilitate continuous learning and encourage organizational change (Young et al., 2004).

Mostafavi et al. (2012) utilized the DLOQ to evaluate the Khorasan Razavi Agricultural Jihad Organization's alignment with the principles of a learning organization. Their findings revealed that, in 28 items, the calculated mean values fell below the acceptable threshold. Gheorghe et al. (2018) confirmed the value of DLOQ as a tool for assessing learning organizations. Furthermore, they demonstrated that the DLOQ can effectively be applied in various fields, such as understanding

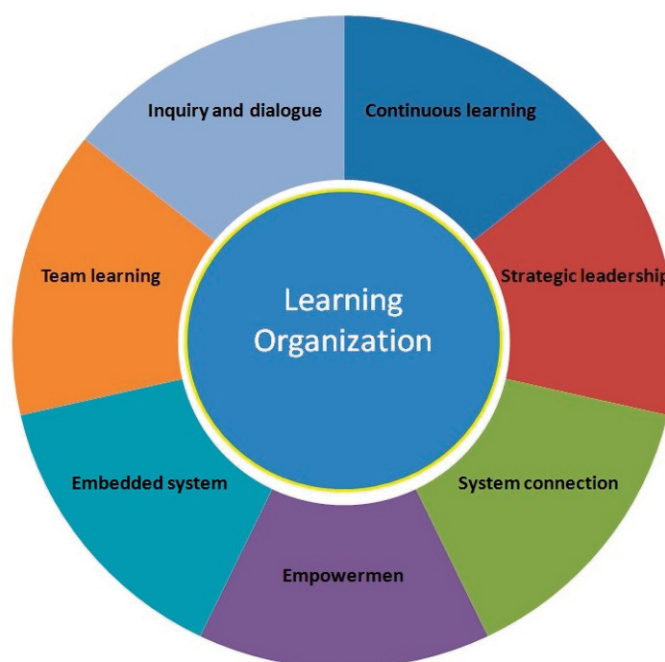


Figure 4. Watkins and Marsick Integrated Model (DLOQ) (Watkins and Marsick, 1997)

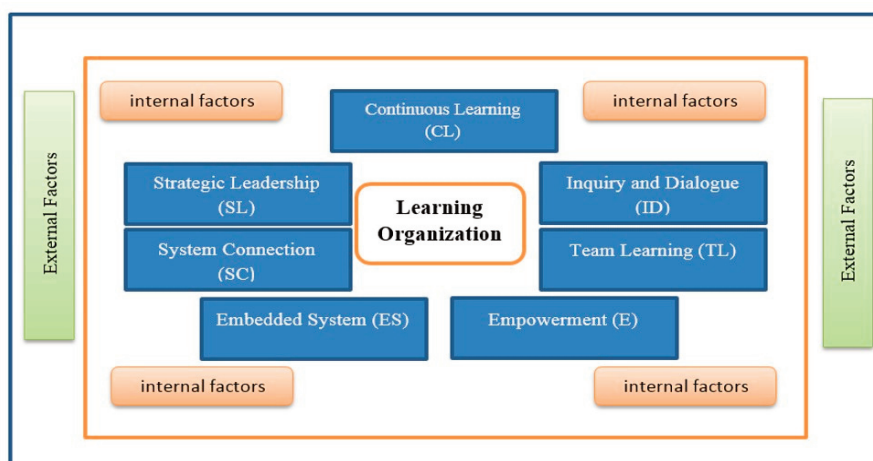


Figure 5. The Research Conceptual Framework

the relationship between leadership attributes and performance or applying learning organization principles to other core concepts like internal marketing and organizational commitment. Regarding the validity of the DLOQ, Kim (2021) demonstrated that adaptive performance, one of the non-financial outcomes improved through learning, significantly impacts financial performance. This study also provided evidence supporting the validity of the DLOQ's structure, particularly its performance criteria.

Chai and Dirani (2018) affirmed the reliability,

validity, and applicability of the DLOQ across various domains. Their research contributed to the foundation of sustainability and identified areas for further refinement and development in the theory and practice of learning organizations. Based on various studies conducted in Iran, there appears to be a disparity in the field of education within agricultural cooperatives. The educational activities in these cooperatives do not align with the principles of a learning organization, which should serve as the bedrock for purposeful and systematic education. Numerous

research efforts have pointed out inconsistencies in educational programs within cooperatives concerning principles like systemic thinking, group learning, shared insights, personal and technical skills, and mental models (Heidari et al., 2015; Varamini et al., 2020; Mostafavi et al., 2012). The research's conceptual framework is elucidated in Figure 5.

METHODOLOGY

The research method employed to achieve the research objectives was a survey research method. The primary aim of this study was to design a model of a learning organization within the agricultural cooperatives of Alborz province. The statistical population for this research comprised members of agricultural cooperatives in Alborz province, with a total of 25,000 individuals (N = 25,000). The sample size was determined using the method proposed by Krejcie and Morgan (1970), resulting in a sample size of 379. The sampling method employed was stratified random sampling.

For data collection, the principal instrument used was a questionnaire. Specifically, this study utilized the Dimensions of Learning Organization Questionnaire (DLOQ), a well-established standard questionnaire for assessing learning organizations. The validity and reliability of the DLOQ have been extensively examined in prior studies. Song et al. (2009) noted that multiple studies (Yang et al., 2004; Zhang et al., 2004; Lien et al., 2006) have affirmed the suitability of the DLOQ across diverse cultures, establishing internal consistency reliability and confirming the robust factor structure of learning organization components (Lien et al., 2006). The questionnaire included seven DLOQ dimensions assessed by 21 items, with responses recorded on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = moderate, 4 = agree, and 5 = strongly agree).

To analyze the collected data, Structural Equation Modeling (SEM) was employed. SEM was used to assess the direct, indirect, and mediated effects of variables in predict-

ing the learning organization. In accordance with Hair et al. (2010), a two-step approach suitable for SEM was adopted: firstly, the measurement model was evaluated, followed by an evaluation of the structural model. Both, average variance extracted (AVE) and composite reliability CR, are necessary for structural equation modeling. General requirements of AVE (≥ 0.5) and CR (≥ 0.7). In our case, according to Forrell and Lacker, (1981), an AVE below 0.50 could be considered if CR is above 0.70. The field part of this research was conducted between January and May 2020.

RESULTS

LO level in ACs based on the DLOQ

Based on the DLOQ, a series of dimensions, such as continuous learning, strategic leadership, system connection, empowerment, embedded system, team learning, and inquiry and dialogue, should be assessed to ensure that the learning organization is managed systematically (Song et al., 2009). Based on the results, the levels of continuous learning, team learning, embedded system, and empowerment were moderate. Additionally, the levels of inquiry and dialogue, strategic leadership, and system connection were low (Table 1).

Continuous learning dimension in ACs

To analyze continuous learning in ACs of Alborz province, three items of continuous learning in DLOQ were used. The most important item was "Help each other to learn" (M = 3.312, SD = 0.813, CV = 0.245).

Inquiry and dialogue dimension in ACs

The important item of inquiry and dialogue dimension was "Provide open feedback" (M=2.997, SD=0.832, CV=0.278).

Team learning dimension in ACs

The important item of the team learning dimension was "Have the freedom to adapt goals" (M=3.012, SD=0.873, CV=0.290).

Embedded system dimension in ACs

The important item of the embedded system dimension was "Make its lessons learned available" (M=3.131, SD=0.871, CV=0.278).

Empowerment dimension in ACs

The important item of empowerment dimensions was "Give people control over resources" (M=2.812, SD=0.898, CV=0.319).

System connection dimension in ACs

The important item of system connection dimensions was "Work with outside/resources" (M=1.997, SD=0.901, CV=0.451).

Strategic leadership dimension in ACs

The important item of strategic leadership dimensions was "Provide opportunities to learn" (M=1.841, SD=0.749, CV=0.407).

Internal and external factors affecting LO in ACs

Internal factors

To identify the factors affecting LO in ACs, two categories of external and internal factors were identified based on the literature review. Then, through expert opinions, these factors and sub-factors were refined, and those that were most suitable for the study's context and garnered the highest consensus among participants were selected for data collection. According to the results presented in Table 2, the most significant internal factors influencing LO in Alborz ACs are as follows: Effective members (EMe) (M=4.38, sd=0.87) Effective managers (EMa) (M=4.16, sd=0.81) Attention to intra-organizational communication (IOC) (M=4.00, sd=0.99) Fostering a learning-oriented attitude (LOA) (M=3.96, sd=1.05) Organizational facilities (OF) (M=3.95, sd=0.99) The results indicate that, from the perspective of the members, the most critical aspect of EMe is their interest in continuous learning, as evidenced by an average score of 4.38 out of 5. Concerning 'EMa', the findings suggest that the most important aspect is paying attention to the strategic plan and its implementation, with an average score of 4.16 out of 5. Regarding IOC, members emphasized the importance of focusing on relationships between sub-sectors, resulting in an average IOC score of 4 out of 5.

External factors

According to the results presented in Table

3, the most crucial external factors influencing the learning organization (LO) in Alborz ACs are as follows: Rules and regulations (RR) (M=4.17, sd=1.04) Government services (GS) (M=4.08, sd=1.06) Inter-organizational interactions (IOI) (M=3.99, sd=1.08) Scientific and technological developments (STD) (M=3.92, sd=1.05) The data indicates that the primary area in need of enhancement within the "Rules and Regulations" (RR) category is a comprehensive overhaul of rules and regulations to support the learning organization, as reflected in an average RR score of 4.17 out of 5. Similarly, within the "Government Services" (GS) category, it is of paramount importance to enhance government policies and orientations to align with the principles of the learning organization, with an average GS score of 4.08 out of 5.

From the perspective of individuals who examined "Inter-organizational Interactions" (IOI), the existence of interactive relationships between organizations is the key focus, resulting in an overall average IOI score of 3.99 out of 5.

Regression analysis

Based on regression analysis, it appears that GS, RR, IOC, LOA, EMa, and EMe may collectively account for a substantial 73.8 percent of the variance ($R^2 = 0.738$) in the LO level within ACs, as demonstrated in Table 4. Examining Table 4 reveals the noteworthy impact of the GS, RR, IOC, LOA, EMa, and EMe variables on the dependent variable. Additionally, we can gauge the collinearity of the model by assessing the Variance Inflation Factor (VIF) values. If the VIF value falls below 10, it indicates that collinearity is not statistically significant (Ommani, 2015). Based on the research findings and the evaluation of collinearity in the regression analysis, it can be concluded that collinearity is not a significant concern in this model.

Structural equation modeling (SEM)

Structural Equation Modeling (SEM) is em-

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Table 1

Learning Organization (LO) Level in Agricultural Cooperative Based On the DLOQ

Orientation	DLOQ dimensions	Items	Mean of each item	Sd	Mean of each dimension	CV	Situation*	LO mean and situation
People-oriented(PO)	Continuous Learning (CL)	Help each other to learn	3.312	0.813		0.245		
		Take time to support learning	3.412	1.012	3.395	0.297	Moderate	
		Being rewarded for learning	3.462	0.912		0.263		
	Inquiry and Dialogue (ID)	Provide open feedback	2.997	0.832		0.278	Low	
		Ask what others think	2.121	0.891	2.502	0.420		
		Spend time building trust	2.389	1.012		0.423		
	Team Learning (TL)	Have the freedom to adapt goals	3.012	0.873		0.290		
		Revise thinking with information	2.986	0.942	2.975	0.315	Moderate	
		Act on our recommendations	2.929	1.009		0.344		
	Empowerment (E)	Recognize for taking initiative	2.921	0.984		0.337		
		Give people control over resource	2.812	0.898	2.896	0.319	Moderate	2.664 Moderate
		Support calculated risk-taking	2.956	0.981		0.332		
Structure-oriented (SO)	Embedded System (ES)	Create measurement system	2.791	1.054		0.378		
		Make its lessons learned available	3.131	0.871	2.980	0.278	Moderate	
		Measure the results of training	3.019	1.005		0.333		
	System Connection (SC)	Encourage global perspectives	1.894	0.958		0.506		
		Work with outside/resources	1.997	0.901	1.993	0.451	Low	
		Encourage diverse perspectives	1.908	1.045		0.548		
Strategic Leadership (SL)	Provide mentoring/coaching	1.912	0.902		0.471			
	Provide opportunities to learn	1.841	0.749	1.909	0.407	Low		
		Ensure the consistent actions	1.975	1.145		0.580		

*1-1.8: Very low, 1.8-2.6: Low, 2.6-3.4: Moderate, 3.4-4.2: High, 4.2-5: Very high

employed to assess and test the direct, indirect, and mediated effects of the variables representing Initial Factors (IF) such as EMe, EMa, IOC, LOA, and OF, along with External Factors (EF) like RR, GS, IOI, and STD, in predicting

the Learning Organization (LO). The outcomes of the confirmatory factor analysis indicate a strong fit of the initial measurement model with the collected data ($X^2 = 619.078$; $X^2 / df = 1.84$; GFI = 0.96; TLI = 0.98; CFI =

Table 2
The Prioritization of Internal Factors Affecting LO in Acs

Items	Mean	SD	Rank of sub-items	Rank of items
Effective members (EMe)	4.38	0.87		
Interest in continuous learning among members	4.59	1.01	1	1
Willingness to work in groups among members	4.34	1.12	2	
Interest in planning affairs among members	4.21	0.09	3	
Effective managers (EMa)	4.16	0.81		
Pay attention to the strategic plan and its implementation	4.22	0.76	1	2
Having a spirit of criticism	4.18	0.88	2	
Knowledge management in the organization	4.08	0.87	3	
Pay attention to intra-organizational communication (IOC)	4.00	0.99		
Pay attention to the relationship between subsections	4.05	1.01	1	3
Paying attention to balancing work and life	4.01	1.07	2	
Use the comments of all members	3.94	1.04	3	
Develop a learning-oriented attitude (LOA)	3.96	1.05		
Creating the necessary platform to develop an interactive attitude between managers and members to develop learning	4.03	1.01	1	
Holding training courses in creating and developing a learning-oriented attitude	3.96	1.03	2	4
Encourage members and managers to have a learning-oriented attitude in the organization	3.91	1.10	3	
Organizational facilities (OF)	3.95	0.99		
Support the development of learning in the organization in terms of resources and time	3.99	1.01	1	5
Development of information and communication technologies	3.96	0.98	2	
Transfer experiences and knowledge in a timely and fast manner	3.91	0.97	3	

0.93; IFI = 0.99; RMSEA = 0.054). Given the optimal fit of the measurement model, it can be concluded that the hypothesized model is well-suited for modeling structural equations, as illustrated in Table 5.

Convergent validity: The first criterion for assessing convergent validity entails ensuring that all standardized factor loads have t-values exceeding 1.96, signifying statistical significance (t-value < 1.96), and they should also exceed a value of 0.50 (Hair et al., 2010). Based on the findings presented in Table 6, the minimum t-value for factor loads stands at 4.27 ($p < 0.01$), and the lowest standardized factor load is 0.532. These calculated values affirm that the data (EMe, EMa, IOC, LOA, OF, RR, GS, IOI, and STD) in this study meet the desired level of convergent validity.

Construct Reliability (CR): A CR value of 0.70 or higher is typically recommended for assessing composite or construct reliability (Nunnally and Bernstein, 1994). As indicated by the results in Table 6, all constructs exhibited construct reliability scores exceeding the recommended threshold of 0.70, thus meeting the standard. The results also demonstrate that the Average Variance Extracted (AVE) estimate for all constructs exceeded the suggested value of 0.50 (Fornell and Larcker, 1981). This outcome underscores the strong composite or construct reliability of the research constructs.

Discriminant Validity: Discriminant validity is established when, during the examination of each construct, it is determined that the square root of the AVE estimate exceeds the

Table 3
The Prioritization of External Factors Affecting LO in ACs

Items	Mean	SD	Rank of sub-Items	Rank of items
Rules and regulation (RR)	4.17	1.04		
Large-scale improvement of rules and regulations for the learning organization	4.21	1.01	1	
Emphasis on creating and codifying protection laws and creating the necessary conditions for their application	4.18	1.05	2	1
Facilitate the rules and use them properly for the development of the learning organization	4.12	1.03	3	
Government services (GS)	4.08	1.06		
Developing government perspectives and missions in developing the learning organization	4.13	1.05	1	
Develop motivational programs and strengthen the spirit of learning and teamwork.	4.08	1.02	2	2
Provide the resources needed to develop a learning organization in government departments	4.03	1.11	3	
Inter-organizational interactions (IOI)	3.99	1.08		
Existence of interactive relations among organizations	4.05	0.98	1	
Exchange of knowledge, skills, and experiences between organizations	3.98	0.94	2	3
Establish constructive competition between organizations	3.95	1.01	3	
Scientific and technological developments (STD)	3.92	1.05		
Utilizing up-to-date knowledge	3.98	1.02	1	4
Ability to use new technologies	3.95	1.04	2	
Use of new management and leadership techniques	3.85	1.11	3	

Table 4
Regression Analysis of Factors Affecting the LO in ACs.

Independent Variables	B	SE B	Beta	t-value	p-value
GS	1.098	2.719	0.814	2.897	0.001
RR	1.113	2.271	0.716	3.597	0.000
IOC	1.243	1.187	0.976	3.943	0.000
LOA	1.321	1.682	0.615	3.945	0.000
EMa	1.117	1.715	0.768	3.058	0.000
EMe	2.092	2.096	0.712	2.054	0.003
Constant	2.513	4.759	0.806	4.598	0.000

correlation between that construct and all other constructs within the model (Fornell and Larcker, 1981). Based on the findings presented in Table 7, this criterion holds true for the square root of each AVE, confirming the presence of discriminant validity.

Structural model assessment

In the process of designing a structural model, the initial step involves identifying and formulating a suitable measurement model. Subsequently, in the second step of structural model design, it is imperative to as-

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Table 5
Summary of Goodness of Fit Indices for the Measurement Model

Fit indices	X ²	P	X ² /df	GFI	CFI	TLI	IFI	RMSEA
Value in study	619.078	0.000	1.84	0.96	0.93	0.98	0.99	0.068
Suggest value	-	>0.05	<3	>0.80	>0.90	>0.90	>0.90	<0.08

Table 6
Results of Confirmatory Factor Analysis for the Measurement Model

Constructs	Indictors	Standardized factor loading	t- value	CR	AVE	
EMe	EMe ₁	0.584	6.87	0.83	0.821	
	EMe ₂	0.592	7.87			
	EMe ₃	0.657	6.54			
	EMa	EMa ₁	0.594	8.78	0.86	0.713
		EMa ₂	0.585	7.62		
		EMa ₃	0.684	8.75		
IF	IOC ₁	0.532	7.58	8.84	0.765	
	IOC ₂	0.591	6.64			
	IOC ₃	0.751	4.98			
LOA	LOA ₁	0.659	7.69	0.91	0.781	
	LOA ₂	0.754	5.16			
	LOA ₃	0.628	7.58			
OF	OF ₁	0.751	9.66	0.89	0.786	
	OF ₂	0.654	5.57			
	OF ₃	0.695	9.65			
RR	RR ₁	0.628	9.58	0.92	0.761	
	RR ₂	0.564	9.25			
	RR ₃	0.658	8.54			
GS	GS ₁	0.849	5.82	0.91	0.672	
	GS ₂	0.781	8.87			
	GS ₃	0.659	4.27			
IOI	IOI ₁	0.681	6.28	0.82	0.698	
	IOI ₂	0.706	6.97			
	IOI ₃	0.784	9.45			
STD	STD ₁	0.899	6.79	0.84	0.714	
	STD ₂	0.934	9.54			
	STD ₃	0.612	8.94			

sess the validity of the proposed model. Within the proposed structural model, hypothetical relationships between constructs are to be thoroughly evaluated. The research findings, as presented in Table 5, indicate that when considering overall fit statistics, a strong alignment was observed between the

structural model and the collected data.

Based on the results of Table 8, it was found that EF has a positive predictive effect on LO ($\beta=0.68$, $t\text{-value}=4.09$, $p<0.001$). It was also found that IF had a positive effect on LO ($\beta=0.71$, $t\text{-value}= 4.48$, $p<0.001$). It was further found that RR, GS, IOI and STD have a

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Table 7

Means, SD, and Correlations with Square Roots of the AVE

	Mean	SD	EMEe	EMEa	IOC	LOA	OF	RR	GS	IOI	STD
EMEe	4.38	0.87	0.91 ^a								
EMEa	4.16	0.81	0.81	0.84 ^a							
IOC	4.00	0.99	0.78	0.81	0.87 ^a						
LOA	3.96	1.05	0.63	0.75	0.59	0.88 ^a					
OF	3.95	0.99	0.54	0.45	0.78	0.58	0.89 ^a				
RR	4.17	1.04	0.76	0.61	0.72	0.60	0.54	0.87 ^a			
GS	4.08	1.06	0.81	0.79	0.52	0.64	0.59	0.74	0.82 ^a		
IOI	3.99	1.08	0.82	0.78	0.41	0.51	0.74	0.59	0.70	0.83 ^a	
STD	3.92	1.05	0.80	0.81	0.62	0.67	0.71	0.54	0.78	0.71	0.84 ^a

**Correlation is significant at the <0.01 level

The square roots of AVE estimates

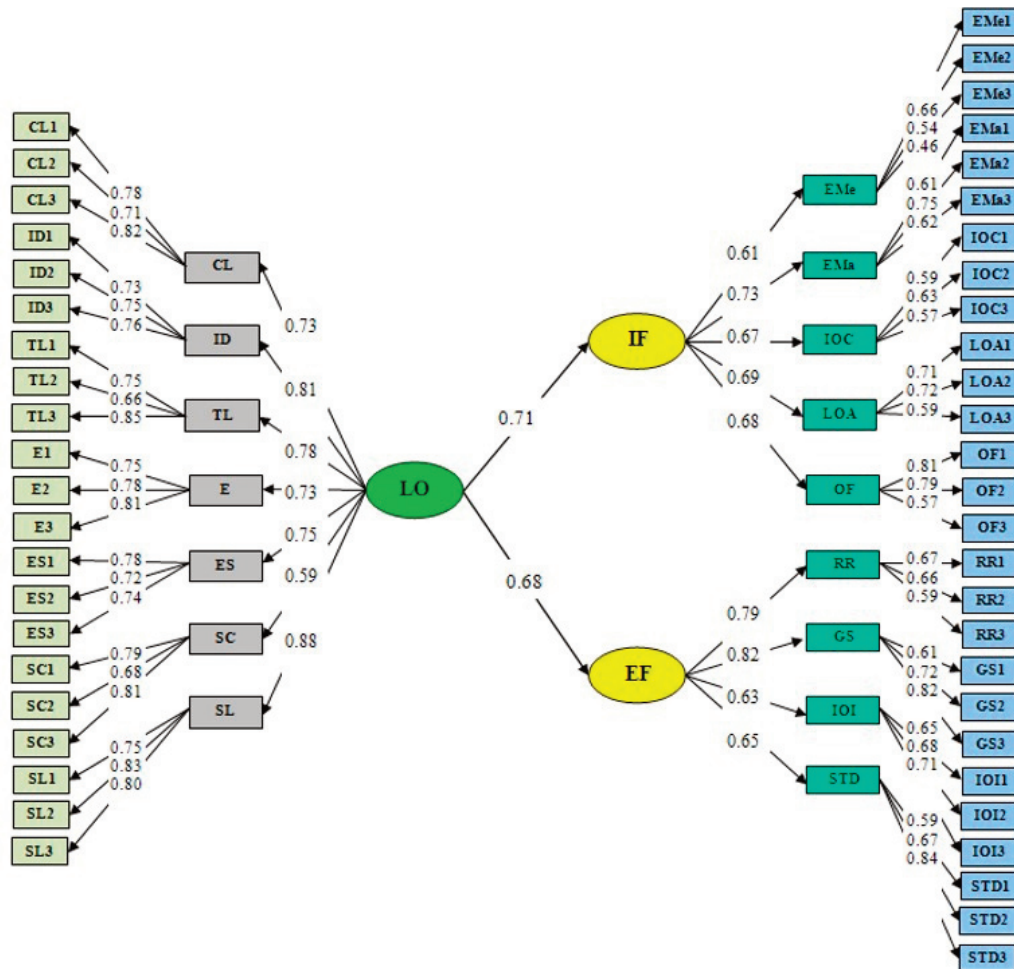


Figure 6. Path Model with Standardized Factor Loadings

significant effect on EF. The results showed that EMe, EMa, IOC, LOA and OF also had a significant effect on IF. The results showed

that the explanatory power of independent variables on the learning organization was $R^2=0.78$. In fact, the results showed that these

Table 8

The effects of RR, GS, IOI, STD, EMe, EMa, IOC, LOA, and OF on LO

Determinant	Outcome ₁	Path coefficient ₁	t-value	Outcome ₂	Path coefficient ₂	t-value	R ²
RR	EF	0.79	4.41	LO	0.68	4.09	0.78
GS	EF	0.82	4.38				
IOI	EF	0.63	3.89				
STD	EF	0.65	3.95				
EMe	IF	0.61	3.99	LO	0.71	4.48	
EMa	IF	0.73	4.12				
IOC	IF	0.67	4.26				
LOA	IF	0.69	4.09				
OF	IF	0.68	4.18				

$p < 0.01$

nine structures (RR, GS, IOI, STD, EMe, EMa, IOC, LOA, and OF) have the ability to explain 78 percent of the changes in LO.

DISCUSSION AND CONCLUSION

Based on the analysis of the Dimensions of Learning Organization Questionnaire (DLOQ) and the resultant findings, it was observed that the levels of continuous learning, team learning, embedded system, and empowerment fell within the moderate range. Conversely, the levels of inquiry and dialogue, strategic leadership, and system connection were categorized as low. In summary, the assessment of agricultural cooperatives as a learning organization yielded a moderate overall rating based on the evaluated indicators. This outcome is consistent with the findings reported by Mostafavi et al. (2012). Given the less than desirable status of agricultural cooperatives as learning organizations, it is recommended to implement practical measures aimed at enhancing each of the learning organization dimensions, with particular emphasis on the most crucial ones identified in this study, such as Strategic Leadership (SL), Inquiry and Dialogue (ID), Team Learning (TL), and Embedded System (ES).

In this regard, it is imperative to consider

practical mechanisms aimed at enhancing the factors influencing the alignment of agricultural cooperatives with the principles of a learning organization, as identified in this study. One of the key outcomes of this research is the identification of both internal and external factors that impact the adaptation of agricultural cooperatives to the concept of a learning organization within the study area.

Based on these findings, a practical suggestion is for agricultural cooperatives in the study area to establish conducive conditions for the development of these identified factors. This, in turn, will create a favorable environment for better alignment with the principles of a learning organization. The internal factors deemed most influential on learning organizations in agricultural cooperatives included effective members, effective managers, attention to intra-organizational communication, the cultivation of a learning-oriented attitude, and access to organizational facilities. These findings are supported by previous research conducted by Celik et al. (2016) and Park (2008).

Furthermore, the most significant external factors affecting learning organizations in agricultural cooperatives encompassed rules and regulations, government services, inter-

organizational interactions, and scientific and technological developments. These findings align with previous research conducted by Liao et al. (2010) and Serrat (2009).

Regression analysis indicated that government services, rules and regulations, intra-organizational communication, the development of a learning-oriented attitude, effective members, and effective managers collectively accounted for a substantial 73.8 percent variance ($R^2 = 0.738$) in the level of learning organization within agricultural cooperatives. These results are consistent with previous research findings from Celik et al. (2016), Park (2008), Liao et al. (2010), and Serrat (2009). It is noteworthy that effective government services can play a pivotal role in facilitating the adaptation of agricultural cooperatives to the principles of a learning organization. These services can provide the initial groundwork for harnessing existing potential and subsequently developing mechanisms for alignment through the active involvement of stakeholders, cooperative members, and managers. Additionally, facilitating supportive laws and regulations is crucial in ensuring compliance.

Despite these factors, prioritizing intra-organizational communication and creating an environment conducive to its development remains critical for providing the essential conditions for agricultural cooperatives to align with the principles of a learning organization. Equally important is fostering a learning-oriented mindset and instilling a belief in the significance of becoming a learning organization among cooperative managers and members.

Upon evaluating the structural model, the overall goodness-of-fit statistics indicated that the structural model aligns well with the observed data. Furthermore, the results showed that rules and regulations (RR), government services (GS), inter-organizational interactions (IOI), and scientific and technological developments (STD) significantly impact external factors, while effective members (EMe), effective managers (EMa),

intra-organizational communication (IOC), a learning-oriented attitude (LOA), and organizational facilities (OF) significantly influence internal factors.

The findings also revealed that these nine constructs (RR, GS, IOI, STD, EMe, EMa, IOC, LOA, and OF) collectively have the capacity to explain 78 percent of the variations observed in the level of a learning organization. This research underscores the significance of the learning organization concept, which is increasingly gaining popularity and application. It is essential to address the knowledge gaps among employees and managers concerning the practical aspects of a learning organization. The study initiates the development of a foundational theory that can be further substantiated through comprehensive investigations. Additional research conducted in diverse cultural and international contexts will contribute to strengthening the foundation and identifying areas for improvement in the research, theory, and practice of learning organizations.

Despite the results suggesting that the Dimensions of Learning Organization Questionnaire (DLOQ) serves as a reliable and valuable instrument for assessing the principles of learning organizations within agricultural cooperatives, further exploration is needed to fully comprehend the utility of this and other instruments designed to evaluate the existence and characteristics of learning organizations.

ACKNOWLEDGMENTS

This manuscript is part of the doctoral dissertation at the Shoushtar Branch, Islamic Azad University. We would like to thank all the people who helped us with the research.

CONFLICT OF INTEREST

The authors have not declared any conflict of interest

AUTHORS' CONTRIBUTIONS

Elahe Kiani has played an effective role in

the development of the problem statement, the importance of the issue, the writing of research literature, the development of research method, data collection and analysis, and final writing. Azadeh Noorollah Noorivandi as the main supervisor in this research, has an important role in supervising the research implementation process, formulating hypotheses, developing the theoretical framework of the research, developing the conceptual framework of the research, supervising the formulation and design of research tools, data collection and data analysis. Ahmadreza Ommani, as the second supervisor, had a supervisory and guiding role in the development of the research plan, data collection and analysis, and final writing. Tahmasb Maghsoudi also had the role of a consultant in data collection and analysis.

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How to cite this article:

Kiani, E., Noorollah Noorivandi, A., Ommani, A., & Maghsoodi, T. (2023). Learning organization model in agricultural cooperatives of Iran: A two-step approach to SEM based on DLOQ. *International Journal of Agricultural Management and Development*, 13(3), 241-260.

DOR: 20.1001.1.21595852.2023.13.3.3.3

