

ORGANIZATIONAL LEARNING AS A CORE COMPETENCE FOR PERFORMANCE IMPROVEMENT IN BUILDING CONTRACTORS

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Abstract: *Learning rapidly and competently has become a preeminent strategy for improving organizational performance in the new knowledge era. Improving dynamic learning capability is an exclusive strategy for corporate success in construction industry. Thus, building contractors should implement organizational learning to accomplish a state of readiness for change and develop a competence to respond and identify future business potentials. The purpose of this research is to analyze the relationship between organizational learning constructs and the learning outcome, performance improvement, and assess the existing practices of organizational learning in order to reach a learning organization status in building contractors of the Turkish Construction Industry. The research involves a questionnaire survey conducted to the building contractors on organizational learning constructs and performance improvement. The research findings support the contribution of organizational learning and its positive influence on performance improvement in construction. The study commences on how all the constructs can be implemented and continuously improved by building contractors while transforming into learning organizations.*

Keywords: *Learning capability, organizational learning, learning organization, performance improvement, building contractors, Turkish Construction Industry.*

Özet: *Yeni bilgi çağında hızla ve yeteneklice öğrenme örgütsel performansı geliştirmede en önemli strateji olmuştur. Dinamik öğrenme kabiliyetini geliştirme de inşaat sektöründe kurumsal başarı için ayrıcalıklı bir stratejidir. Bu nedenle inşaat müteahhitlerinin değişim için bir hazırlık yaparak örgütsel öğrenmeyi uygulamaları ve gelecekteki iş potansiyellerine karşılık vermek ve tanımlamak için yetkinlik geliştirmeleri gerekir. Bu araştırmanın amacı örgütsel öğrenme kavramları ile öğrenme çıktısı olan performans geliştirme arasındaki ilişkiyi analiz etmek ve Türk inşaat sektöründeki inşaat müteahhitlerinin öğrenen örgüt durumuna erişmek için gerçekleştirdikleri mevcut örgütsel öğrenme uygulamalarını değerlendirmektir. Araştırma örgütsel*

öğrenme kavramları ve performans geliştirme üzerine inşaat müteahhitlerine uygulanan bir anket çalışmasını içerir. Araştırma bulguları örgütsel öğrenmenin inşaat sektörüne olan katkısını ve performans geliştirmedeki olumlu etkisini desteklemektedir. Çalışma örgütsel öğrenme ile ilgili tüm kavramların öğrenen örgüte dönüşürken inşaat müteahhitleri tarafından nasıl uygulanabileceği ve sürekli geliştirebileceği üzerine yorumlar yapmaktadır.

Anahtar kelimeler öğrenme kabiliyeti, örgütsel öğrenme, öğrenen örgüt, performans geliştirme, inşaat müteahhitleri, Türk inşaat sektörü.

1. INTRODUCTION

The importance of organizational learning for the success and survival of organizations is widely recognized. Tjandra and Tan (2002) state that over the years learning has become increasingly important due to rapid changes in the market conditions, competition and technological developments, which leads to changes in the work and the way work is organized. Organizations are increasingly required to be learning systems if they wish to thrive in dynamic business arena. The ability and rate at which organizations can learn and react more quickly than their competitors, has emerged as a pre-eminent sustainable source of competitive advantage (De Geus, 1988; Stata, 1989; Nonaka, 1991; Jashapara, 2003).

Knowledge-based resources are considered particularly important for providing competitive advantage (Grant, 1996; Spender, 1996), and learning processes are thus necessary to transform and refine a firm's knowledge resources in accordance with the environmental conditions. This link between knowledge and learning processes is often associated with the organizational capability to learn (Crossan *et al.*, 1999; Sanchez, 2001). The link between organizational learning and business performance has been often discussed in literature (Cangelosi and Dill, 1965; Slater and Narver, 1995; Jones, 2000; Calantone *et al.*, 2002; Ellinger *et al.*, 2002; Lopez *et al.*, 2005; Prieto and Revilla, 2006), and there are also recent studies that analyze how organizational knowledge affects business performance (Brockman and Morgan; 2003; Droge *et al.*, 2003; Haas and Hansen, 2005; Yeo, 2005).

Kululanga *et al.* (2001) summarized the concept of organizational learning as the progress from a doing to a thinking workforce, from a reactive to a proactive readiness to change, from loss to gain of competitive advantage, from status quo to continuous improvement. Tjandra and Tan (2002) proposed a general model to be empirically tested the construction firms operating in Jakarta, Indonesia by considering various factors affecting organizational learning, and by measuring the variables instead of merely providing descriptions. Kululanga *et al.* (2002) presented a quantitative analysis of organizational learning by construction contractors. The principles that underlie organizational learning and the factors that promote double-loop learning as a strategy for improving construction contractors' business processes were presented. Chan *et al.* (2005) recommend a number of research challenges including the need to examine organizational learning beyond project partnering; an emphasis on the inter-organizational dynamics involved in both the process and outcomes of organizational learning and the investigation of construction projects as learning networks.

The necessary conditions for competitiveness for Turkish construction industry include strong and sustained levels of productivity growth, openness to innovation and new technology, and a commitment to delivering value for the clients' monetary investment. There is continuous interest in the industry to develop new methods to improve organizational effectiveness. Driving forces in construction industry indicate that the ability to innovate is quickly becoming a competitive necessity. However construction industry has been generally slow to embrace innovation and radical changes as fundamental changes in construction processes require shifts in the conservative management perspectives of building contractors. There is an urgent need to change the culture of the firm in simple ways first by seeing knowledge as an important part of the firm's efficiency and effectiveness, possibly not using information technology to start with but focusing on ways to encourage knowledge sharing. Building contractors need to better manage their knowledge assets if they are to remain competitive in the future. Therefore learning rapidly and competently has become a pre-eminent strategy for improving organizational performance in the new knowledge era. Improving dynamic learning capability is an exclusive strategy for corporate success in construction industry. Thus building contractors should implement organizational learning to accomplish a state of readiness for change and develop a competence to respond and identify future business potentials. The purpose of this research is to analyze the relationship between organizational learning constructs and the learning outcome "performance improvement", and assess the existing practices of organizational learning in order to reach a learning organization status in building contractors of the Turkish Construction Industry.

2. ORGANIZATIONAL LEARNING AND THE LEARNING ORGANIZATION

Thomsen and Hoest (2001) states organizational learning and learning organizations can be seen as two sides of the same coin. The process to become a learning organization is through the development of organizational learning and organizational learning is the central activity in the learning organization (Gephart *et al.*, 1996; Tsang, 1997).

2.1. Organizational Learning

Organizational learning is learning that occurs as knowledge is transformed from an individual to a collective level (Spender, 1996). Gronn (1997) argues that organizational learning represents the procedures to which organizations adhere for sustaining, supplementing and improving the knowledge practices related to their core functions. Dixon (1998) and Snell and Chak (1998) suggest that organizational learning entails meaningful change in the processes, structures or concerns connecting individual members. Easterby-Smith (1999) suggests that organizational learning is a process of organizational transformation and argues that individual and collective learning, fostered by learning activities, play a key role to furthering this process.

According to Stewart (2001), organizational learning is a type of collective cognition where individuals constantly make sense of the environment and negotiate each other's learning experiences. In such systems that are defined by collective learning, such as communities of practice, there is a constant interplay of new meanings created, which is a reflexive and dynamic process as experienced by individuals. Organizational learning

establishes a link between the organization and the environment that encourages proactive rather than reactive behavior.

2.2. The Learning Organization

The concept of the learning organization, most often attributed to Senge (1990), revolves around the identification of characteristics of organizational culture and climate that help develop a learning culture. Pedler *et al.* (1991) stress that it is an organization as a whole that facilitates the learning of all its members to continuously transform itself. Rather than being an individual activity, it needs to be a coordinated effort. Such organizations are skilled in creating, acquiring and transferring knowledge, and modifying its behavior to reflect new knowledge and insights and be able to act accordingly (Garvin, 1993; 1998). Senge *et al.* (1994) defined learning organizations “organizations where people continually expand their capacity to create results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together”. Watkins and Golembiewski (1995) declare that the learning organization is “a tentative road map, still indistinct and abstract” and “a never ending journey”.

The learning organization refers to an organization that is designed to enable learning and has an organizational structure with the capability to facilitate learning. The concept of learning organization is used to refer to a particular type of organization, which can be considered as an ideal form of system in which learning behavior improves and adapts, and in which a concrete climate facilitates the learning of individuals, and managers are supposed to be coaches instead of directors (Ortenblad, 2001).

2.3. Measurement of the Constructs and the Learning Outcome

Several key organizational learning facilitators that support the development and operation of a learning organization, and result in the organizational learning outcome (Improved organizational performance) are identified. The identified facilitators are the key constructs in process of transformation into a learning organization. These constructs are “Organizational environment”, “Strategy development and implementation”, “Supportive leadership”, “Leveraging knowledge”, and “Learning capability”. The organizational learning constructs and the learning outcome are as follows.

A. Organizational Environment

Today’s building contractors operating within the industry deals with the continual changing environment to facilitate the learning process, creates and distributes information and knowledge. Awareness for the need of different levels of learning, knowledge sharing use in practice is paramount. Every member within the organization should be willing and prepared to undertake learning, knowledge sharing, adaptation, and change. Commitment to learning and to continuous improvement through learning will be demonstrated in a culture of openness and without boundary, to remove barriers to learning and foster a participative work. Organizational environment is evaluated by assessing the openness of communication within the firm, the positive attitude of professionals to change, continuous

self-development, satisfaction with the work environment, and commitment to complete work together. Construction managers who would like to facilitate learning in the organization, improve performance and promote a better organizational environment will show their commitment to learning, provide incentives to use that learning and use a more collaborative approach.

B. Strategy Development & Implementation

If building contractors are to become adaptive and responsive to the competitive environment then they have to rethink their approaches so that learning can become an organizational norm and the vision of building a learning organization can be actualized. This may require building contractors to revisit their approaches to organizational survival, strategy development, and organizational change. Organizational learning process includes strategies and policy making to be structured ensuring involvement of all members. The vision and mission should clearly reflect the direction and purpose of the organization and must be communicated and supported by individuals. Long-term commitment to learning is supported by clear strategic direction. Training needs should be determined, and training systems should be continuously evaluated for effectiveness. Through training and education, employees will be equipped with tools for self-monitoring and self-correction, leading to continuous learning and improvement.

C. Supportive Leadership

Good leadership is needed in order to establish a supportive and participative organizational environment that helps design a new form of organization which emphasizes learning, flexibility, and rapid response. Leaders focus on building relationships, creating shared vision and strategy, and empowering people to enhance commitment to learning. Leaders should influence others through vision, values, and relationships, rather than power and control. Leaders should be personnel in charge who act as coaches, guides, facilitators and provide direction when required. For successful learning, leadership has a profound impact on the organization. Leaders who recognize knowledge as a critical resource have a positive attitude towards organizational learning. There is a link between organizational learning facilitators and learning orientations in which leadership commitment is at the heart of organizational learning activities.

D. Leveraging Knowledge

For building contractors competing in the knowledge economy, the capacity to leverage knowledge is critical. To thrive in the new environment, building contractors must invest in knowledge tools and processes that contribute to strategic direction, while overcoming knowledge gaps. The organizational learning process is measured by determining how learning activities occur within the firm. This includes three phases: knowledge acquisition, knowledge sharing, and knowledge utilization. Knowledge acquisition is measured by how much new knowledge has been created or acquired by individuals in the firm, how much the staff have improved their professional knowledge, how often they reflect on their work, and learn from experience. Knowledge sharing is assessed by how quickly a new skill or knowledge can be disseminated throughout the firm, how much and often knowledge is shared among the professionals, and how much the staff learns from

this exchange. Knowledge utilization considers how much professional staff tries new approaches in their jobs, and how often they change their design methods or work process.

E. Learning Capability

Learning capability has been measured as a multi-dimensional construct in which knowledge stocks and learning flows are considered as representative dimensions. Knowledge stocks in organizations exist at several levels: the individual, the group and the organizational levels. Obviously, organizations learn through their individual members, which develop knowledge through their personal experiences. Some individual knowledge may be applied directly to perform the assigned task, but much of it is shared with other individuals in a group before becoming a basis for action. This way, individuals inside groups develop knowledge in common in order to perform tasks in a coordinated fashion. Similarly, groups in an organization interact and communicate their knowledge to other groups, and acquire from them knowledge required to put their own knowledge into action. As a result, knowledge becomes integrated in the organization, and embedded in its systems, routines and values. Learning flows in organizations are aimed at both the exploration and the exploitation of knowledge. Exploration flows occur when individual members generate new knowledge, and the groups and the organization progressively integrate it. Exploitation flows encompass processes that take and transmit embedded organizational knowledge that has been learnt from the past down to groups and individual members.

F. Performance Improvement

Organizational performance needs to be assessed to highlight strengths and improvement opportunities and to reduce gaps. Effective measurement systems are ones which are balanced, integrated and designed to highlight the critical inputs, outputs, and process variables. Relevant measures of performance improvement is timesaving, cost reduction, improving quality of performance, improvement in processes, change in methods, increasing productivity, getting new projects, and the level of innovation in the construction and management processes.

3. HYPOTHETICAL MODEL OF FRAMEWORK FOR ORGANIZATIONAL LEARNING

In this research, organizational learning constructs which support the creation of a learning organization are dealt with a model of framework. The developed research model is focused on examining the relationship between the organizational learning constructs and the outcome, *organizational performance improvement*, and assessing the existing practices of organizational learning in order to reach a learning organization status in building contractors of Turkish construction industry. The organizational learning hypothetical model of framework is illustrated in Figure 1. The fundamental purpose of this model is to facilitate learning in the organization, improve performance and promote a better organizational environment.

Organizational learning is a dynamic process that does not happen only through time, but also through different levels or dimensions of the organization. The dynamics is created through the tension between the organizational assimilation of new knowledge developed at individual level (feed-forward), and the use and individual exploration of organizational pre-existing knowledge (feedback). This tension occurs because organizational learning is not only the innovative process associated to feed-forward, but also the feedback process, which generates ways to explore what has already been learnt (Crossan *et al.*, 1999). Organizational learning establishes a relationship between environmental change and business strategy. Even attributing organizational learning the capacity to change that relation over time is a way of recognizing that organizational learning is strategically significant (Crossan and Berdrow, 2003).

Organizational learning seems to develop competencies that are valued by the clients, hardly imitable, and, as a consequence, they contribute to the competitive advantage of the firm (Crossan and Berdrow, 2003). Company performance should be analyzed with respect to important performance measures, and so identify learning disabilities and performance gaps. Such anomalies would be investigated and viewed as learning opportunities, and would be assimilated for effective actions. A linkage between strategy, actions, and measures is essential in order to improve performance (Ahmed *et al.*, 1999).

Learning capability can be conceptualized as the potential to explore and exploit knowledge through learning flows that make possible the development, evolution and use of knowledge stocks that enact organizations and their members to add value to the business. Learning capability thus comprises dynamically evolving knowledge stocks that continually flow both upward and downward all of individuals, groups and the overall organization (Nonaka and Takeuchi, 1995; Crossan *et al.*, 1999). Understanding learning capability by gathering together both knowledge stocks and learning flows highlights three main aspects. First, the interdependence between knowledge stocks and learning flows implies the existence of constant internal changes that lead to a continuous improvement that allows the organizational activities to be maintained, improved or adapted according to the environmental conditions (Jerez-Gomez *et al.*, 2005).

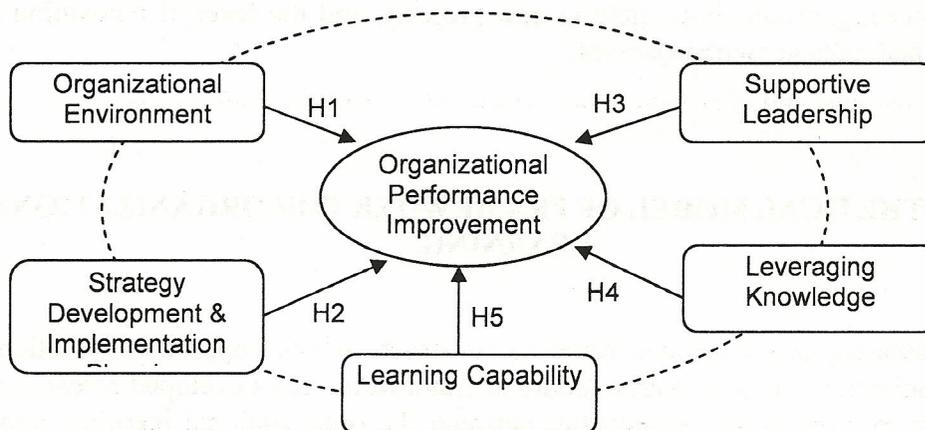


Figure 1: The model linking organizational learning constructs to organizational performance improvement

Second, the ongoing creation, acquisition, dissemination and integration of knowledge within the organization becomes a strategic capability that leads to continuous learning and further development of knowledge that is idiosyncratically complex and dynamic and, thus, unique (Barney, 1991; Grant, 1996; Spender, 1996). Aspects of knowledge stocks

that are valuable, rare and not easily imitable can be sources of competitive advantage, but only if the organization is able to make the most of them through learning flows.

Third, the effectiveness of learning capability should not be assessed on the basis of the bulk of knowledge stocks and learning flows, but on the basis of its utility in guiding behaviors relative to the organization's relevant domain. It is not enough that learning flows generate new knowledge stocks, but the new knowledge needs to be relevant in the strategic context of the organization (Crossan *et al.*, 1999; Vera and Crossan, 2003).

Therefore, an organization's superior performance depends on its ability to defend, capitalize and apply knowledge that it creates (Teece *et al.*, 1997; Teece, 2000; Carmeli and Tishler, 2004) in combination with other resources and competences of the firm, and in agreement with its strategic direction.

4. RESEARCH HYPOTHESIS AND METHODOLOGY

4.1. Research Hypothesis

So far, a thorough review of literature about organizational learning constructs; *organizational environment, strategy development and implementation, supportive leadership, leveraging knowledge, learning capability* and organizational learning outcome has been performed to develop the research hypotheses. Review of the literature indicates that there are significant positive relationships between learning organization constructs and organizational learning outcome, *performance improvement*. The relationship between the dependent variable, *organizational performance improvement*, and the independent variables of the organization learning constructs, will be identified to explain the theory underlying these relationships and to describe the direction of the relationships. This leads development of the following hypotheses:

H1. Organizational environment is positively associated with organizational performance improvement.

H2. Strategy development & implementation is positively associated with organizational performance improvement.

H3. Supportive leadership is positively associated with organizational performance improvement.

H4. Leveraging knowledge is positively associated with organizational performance improvement.

H5. Learning capability is positively associated with organizational performance improvement.

4.2. Research Methodology

A. Sampling

A list of building contractor organizations within the construction sector was obtained from the Turkish Contractors Association (TCA). The list consisted of a total of 163

member organizations. The sample includes relatively medium to large companies. Company size is determined by the number of professional staff, number of construction projects per year, and the size of a typical project in US dollars. A company with more than 75-100 employees is defined as large – 75 percent were large size companies. The number of projects per year ranged from 10 to 25 projects, 55 percent were involved 10 to 20 projects. Project size ranged \$10 million to \$50 million (90 percent) and to over \$100 million (10 percent). In this study, small size companies were not taken into consideration and kept out of the survey as they are not included in the TCA main list.

B. Data Collection

The empirical data was collected through a questionnaire survey, which was administered to the firms registered to the TCA. During the survey, all these firms (163 member organizations) were contacted and asked by the TCA to participate in the study. They were then fully informed of the research objectives, that the research was a strictly scientific and confidential and that their anonymity was assured. A total of 121 completed questionnaires were received, giving a high response rate of 74 per cent indicating that the sampling procedure was effective and that the respondents perceived the research to be relevant and worthwhile. The questionnaire consisted of 66 statements. The respondents were asked to rate the extent to of agreement with each statement based on a five point Likert scale of 1 (strongly disagree) to 5 (strongly agree). Contact personnel in the companies for the questionnaire survey were either the top management or senior management in their respective departments, therefore their level of knowledge expected to provide responses was acceptable for the purpose of validity of the survey results.

4.3. Analysis and Results

Statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS). Factor analysis was used to determine the key dimensions in the variables of the organizational learning constructs. A multiple regression analysis was then used to examine relationships among the independent variables of the organizational learning constructs and the dependent variable, “organizational performance improvement”.

The variables of the organizational learning constructs were empirically tested and validated by principal component factor analysis using the statistical software package SPSS. Summary of the results is shown in Table 1 (see Appendix) Overall and individual measures of sampling adequacy were computed to assess the appropriateness of the data for factor analysis. Values greater than 0.5 are considered acceptable. The reliability for each of the extracted factors is established by checking these factors for internal consistency using Cronbach’s alphas. Cronbach’s alpha (α) is based on the average correlation between variables within each factor where a value of 0.7 is the minimum acceptability value. Examination of the Cronbach’s α values revealed that all of the reliability coefficients α for the constructs listed in Table 1 (See Appendix) have acceptable levels of reliability. Some constructs were more reliable than others. The constructs “supportive leadership” and “learning capability” have the highest reliability coefficients α . All the constructs are interrelated and focus on “Organizational performance improvement”. Table 2 represents the correlation of the independent and dependent variables factors. Examination of the correlation matrix shows that there are significant

linear associations among factors representing the variables such as “supportive leadership”, “learning capability”, and “organizational performance improvement”.

The degree and character of the relationship between dependent and independent variables of the organizational learning constructs was assessed by using a multiple regression analysis. Tables 3-4 (See Appendix) represent the multiple regression analysis results of all five factors regressed on the dependent variable of organizational performance improvement. Results reveal that one construct, “learning capability”, proved to be strongly significant and positively related to performance improvement where the regression coefficient b is 0.453 at 0.05 significant levels. Thus, “learning capability” is one significant predictor of the learning organization that is designed to enable learning and has an organizational structure with the capability to facilitate learning. Other independent variables of constructs like “organizational environment” and “strategy development and implementation” are not so significantly related.

It is important to mention that all of the independent variable constructs had significant positive correlation with each other; explaining the reason behind the regression results produced by the method of least squares, β 's regression coefficients. This analysis tested the hypothesis stated earlier, and hence contributes to the knowledge regarding the relationship between organizational learning constructs and performance improvement. The coefficient of correlation R value of 0.769 is an indication of a relatively strong relationship, accompanied by an F -statistic for the regression which is highly significant p -value of 0.006.

5. DISCUSSION

Considering the above findings, all the hypotheses on the reliability and validity is supported and each of the organizational learning independent and dependent variables from both a theoretical and statistical perspective form solid constructs. The proposed organizational learning model has a content validity which is the assessment of the correspondence of the constructs and its conceptual definition. There is support in the literature that the proposed organizational learning model has implementation constructs and measurement items that cover these dimensions.

The proposed organizational learning model has validity since it measures the theoretical constructs that it was designed to measure. The constructs of the organizational learning were structured by component factor analysis. Factor loadings are shown in Table 1, and were well accepted. Criterion or predictive validity is concerned with the extent to which the organizational learning model is related to independent measures of organizational performance improvement. It was determined by examining the Multiple R coefficient of correlation for the constructs when regressed on “organizational performance improvement”. The R value of 0.769 indicates that the independent variables have a reasonably high degree of criterion related validity. Again, considering this result of the regression analysis of the organizational learning constructs regressed on “organizational performance improvement”, all hypotheses on the positive relationship between these constructs and “organizational performance improvement” is supported.

Fig. 2 shows the proposed Organizational Learning Model of Framework for Building Contractors in Turkish construction industry. The models presents how all these constructs can be implemented efficiently, and continuously improved by building contractors while transforming into learning organizations. Market-driven demand has building contractors looking to specialize in a niche. While not a new concept, emerging markets in today's technology-driven construction have made specialization a profitable choice for some firms. Thus the knowledge of an organization characterizes the dominating strength of the company. Furthermore it develops simultaneously an intangible competitive advantage. There must an initiative to facilitate the sharing of best practices, experiences and showcase the benefits derived from innovations. Participants share experience and knowledge gained from their individual projects through a peer review process. The role of a leader is vital in promoting learning. Learning will not only take place at an individual level but more importantly at a group level towards organizational learning. The roles of a leader consist of developing vision, empowering, inspiring, and stimulating people. By doing so, a leader would be the driving force for learning. Regarding the point of view of organizational learning, the uniqueness and temporality of the project organization bring their own challenges and difficulties. Knowledge and lessons learned from the past that belong to individuals are converted into organizational property, made accessible to the other members of the organization.

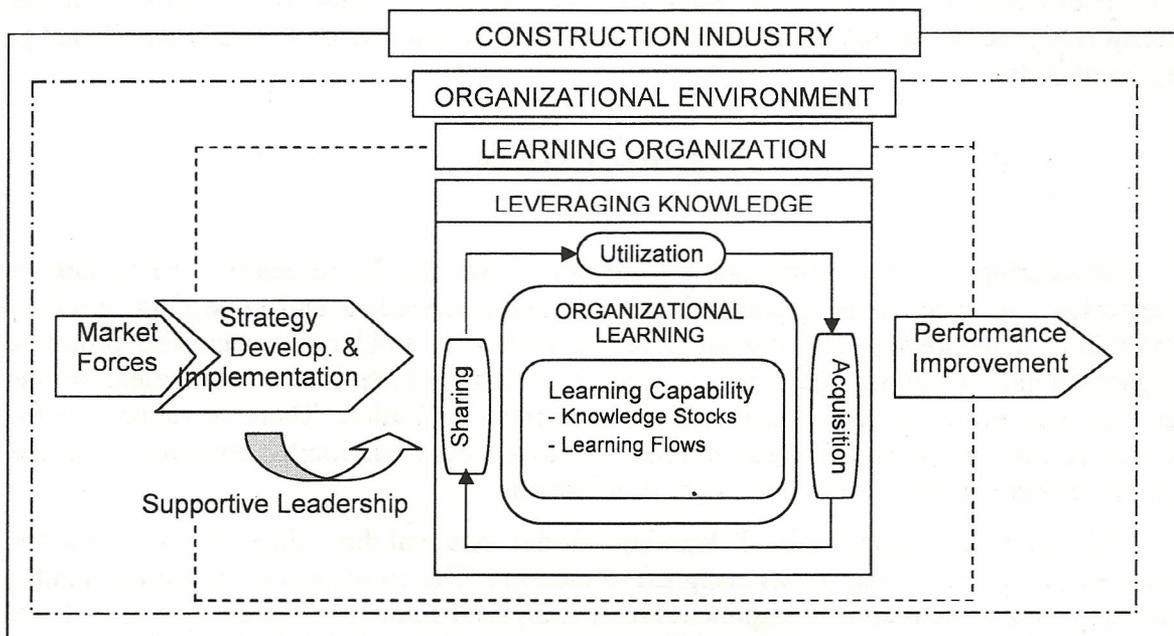


Fig. 2 Organizational Learning Model of Framework for Building Contractors: Turkey Perspective

Organizational learning is a dynamic process of creation, acquisition and integration of knowledge aimed at the development of resources and capabilities that contribute to better organizational performance. Organizational learning is a critical component of knowledge management. An organization's culture and climate can have a significant effect on the amount and type of learning that occurs. Therefore, it is important to understand how cultures and climates affect organizational learning and how they can be assessed relative to learning. Learning capability is the ability of the organization to learn the lessons of its experience and to pass those lessons across boundaries and time. Without this capability, the organization will tend to recreate its own solutions rather than leverage its investments

in change and improvement. Organization learning capabilities are useful for organizations of all kinds because they enable for an active transformation of practices on basis of new experiences and novel thinking. Learning capabilities is therefore one of the mechanisms that make organizations remain viable in terms of continuously producing new ideas and suggestions for changes.

6. CONCLUSION AND RECOMMENDATIONS

A hypothetical model for the organizational learning in building contractors of Turkish construction industry is constructed and validated. The model explored the organizational learning constructs and the learning outcome (performance improvement) that can be implemented and continuously improved by organizations when transforming to learning organizations. The empirical research results revealed that the organizational learning structure in building contractors incorporates five constructs: organizational environment, strategy development and implementation, supportive leadership, leveraging knowledge, and learning capability. Assessment of the practical implications of these constructs indicated that most of the building contractors at their current status can not be qualified as completely learning organizations who facilitate the learning of all their members and continually transforms themselves. However, building contractors acquire an awareness, which transform their behavior for improved performance, have readiness for change, capabilities for continuous improvement, thinking workforces, and sources of competitive advantage.

In this state of transition, building contractors are in tension between their beliefs and the required actions for meeting the challenges of the business environment. Therefore, contractors need to improve existing practices of organizational learning in order to reach a learning organization status. A valid and reliable instrument to measure the dimensions or constructs of the learning organization concept in Turkish construction industry is newly developed (as no measures existed from prior research). The variables of the construct are a valid and reliable measurement for assessing the development of the learning organization concept in Turkish construction industry.

This study provides empirical evidence for the importance of the relationship between organizational learning constructs and the learning outcome, performance improvement. The results show that each of these variables has a different role and significant positive impact on the organizational learning process and organizational performance improvement. Pearson correlation coefficient indicates that most of the independent variable constructs had significant positive correlation with each other. Considering these research findings, all hypotheses, testing the reliability and validity, and the positive relationship between the organizational learning constructs and the learning outcome, organizational performance, are supported.

Relationship assessment revealed that one construct, "Learning capability", proved to be strongly significant and positively related to company performance in Turkish building contractors. Thus, it is found that learning and development is the most significant predictor of learning organizations. Consequently, contractors must to focus initially on this fact to aid in the transformation from the current state to that of a learning organization. Another important emphasis is the "Supportive leadership". Supportive attitudes, behaviors and incentives will follow this commitment. This will create an organizational environment in which knowledge acquisition, sharing and utilization will be

facilitated. The organizational structure and operations should also be designed in such a way to maximize the interaction among staff in terms of knowledge and learning.

In Turkish construction industry, the uniqueness and temporality of the project organization bring their own challenges and difficulties. Building contractors consider issues of learning and knowledge sharing as a strategic organizational concern. There are ongoing processes of learning taking place in all construction projects, in the individual work, within communities of practice, and between some of the professional groups. Knowledge and lessons learned from the past that belong to individuals are converted into organizational property, made accessible to the other members of the organization. Organizational culture plays an important role in shaping the members' behavior and creating the learning environment. Thus an appropriate organizational design will enable an organization to execute better, learn faster, and change more easily.

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Construct	Independent Variables	Eigen Value	Factor Loading	Cronbach's α
Organizational Environment	Positive attitude to change	4.773	0.756	0.865
	Climate of open communication		0.741	
	Continuous self-development		0.729	
	Satisfied work environment		0.715	
	Commitment to complete work together		0.704	
Strategy Development & Implementation	Statement of vision	5.179	0.797	0.891
	Statement of mission		0.789	
	People involvement		0.772	
	Performance measurement		0.759	
	Training evaluation		0.747	
Supportive Leadership	Personnel in charge	5.865	0.891	0.941
	Company's vision		0.882	
	Leader involved		0.869	
	Appreciate successful learning		0.857	
	Mentoring and coaching		0.843	
	Flexibility		0.840	
	Rapid response		0.827	
	Building relationships		0.815	
	Enhance commitment		0.804	
	Leveraging Knowledge		<i>Knowledge Utilization</i>	
Change methods		0.773		
Try new way		0.660		
Change procedures		0.652		
Apply new knowledge		0.636		
<i>Knowledge Sharing</i>				
Learn from each other		0.623		
Exchange knowledge		0.611		
Knowledge sharing easily		0.597		
Knowledge sharing frequently		0.583		
<i>Knowledge Acquisition</i>				
Improve knowledge		0.568		
Develop new knowledge		0.556		
Self-reflect		0.543		
Improve competence		0.531		
Learn new knowledge		0.518		
Learning Capability		Knowledge Stocks	5.339	
	<i>Individual-level knowledge</i>			
	Being knowledgeable and qualified about work	0.829		
	Have skills and competences for working properly	0.825		
	Being aware of critical issues that affect work	0.821		
	Feel confident about doing work	0.817		
	Feel a sense of responsibility on work	0.814		
	<i>Group-level knowledge</i>			
	Develop a common knowledge about work	0.818		
	Have capability to make decisions concerning work	0.816		
	Have capability for effective conflict resolution	0.805		
	Properly coordinate and organize their work	0.810		
	Successes and failures shared within the groups	0.804		
	<i>Organizational-level knowledge</i>			
	Have a strategy that positions well its future	0.798		
	Have a structure that allows working effectively	0.805		

	Have management methods that allow working efficiently			0.804
	Have systems and documents containing worthy information			0.796
	Culture is properly distinctive			0.792
	Learning Flows			
	<i>Exploration</i>			
	Individual lessons learnt are exchanged within their work group			0.788
	Individuals share knowledge as they work within groups			0.792
	Individuals have input into the organization's decisions			0.784
	Organization puts in operation suggestions made by groups or individuals			0.776
	Organization do not "reinvent the wheel"			0.780
	<i>Exploitation</i>			
	Policies and procedures guide individual work			0.782
	Internal training and work training are provided within the organization			0.772
	Interdisciplinary training, work rotation and special assignments are usual			0.776
	Individuals know and put in operation group decisions			0.768
	Past experiences influence on organizational future behaviour			0.766
	Dependent Variables			
Performance Improvement	Extensive innovation in construction	5.675	0.843	0.923
	Extensive innovation in management			0.833
	Significant improvement in process			0.821
	Significant change in method			0.809
	Improve quality of performance			0.797
	Increase productivity			0.785
	Save costs			0.773
	Save time			0.761
	Get new project			0.748

Table 1. Factor Analysis and Reliability Test

Variables	1	2	3	4	5	6
1. Organizational Environment	1.000					
2. Strategy Development and Implementation	0.490	1.000				
3. Supportive Leadership	0.523	0.483	1.000			
4. Leveraging Knowledge	0.447	0.422	0.475	1.000		
5. Learning Capability	0.502	0.531	0.543	0.559	1.000	
6. Performance Improvement	0.567	0.571	0.573	0.585	0.615	1.000

Table 2. Correlation matrix of variables constructs

Dependent Variable	Performance Improvement
Multiple R	0.769
R Square	0.575
Adjusted R Square	0.493
Standard Error	0.429

Table 3. Multiple Regression Analysis (Dependent Variable)

Independent Variables	β	T	Significant
Organizational Environment	0.171	1.561	0.375
Strategy Development and Implementation	0.167	1.943	0.428
Supportive Leadership	0.389	2.119	0.496
Leveraging Knowledge	0.295	1.785	0.383
Learning Capability	0.453	2.357	0.582

Notes: F = 3.725; significant = 0.006

Table 4. Multiple Regression Analysis (Independent Variables)

Research Questionnaire

"To what extent do you agree with the following items contributing to your <i>organization's learning</i> ? (1=strongly disagree; 5=strongly agree)."		strongly disagree			strongly agree	
1.	Organizational Environment					
a.	Positive attitude to change	1	2	3	4	5
b.	Climate of open communication	1	2	3	4	5
c.	Continuous self-development	1	2	3	4	5
d.	Satisfied work environment	1	2	3	4	5
e.	Commitment to complete work together	1	2	3	4	5
2.	Strategy Development & Implementation					
a.	Statement of vision	1	2	3	4	5
b.	People involvement	1	2	3	4	5
c.	Performance measurement	1	2	3	4	5
d.	Training evaluation	1	2	3	4	5
3.	Supportive Leadership					
a.	Personnel in charge	1	2	3	4	5
b.	Company's vision	1	2	3	4	5
c.	Leader involved	1	2	3	4	5
d.	Appreciate successful learning	1	2	3	4	5
e.	Mentoring and coaching	1	2	3	4	5
f.	Flexibility	1	2	3	4	5
g.	Rapid response	1	2	3	4	5
h.	Building relationships	1	2	3	4	5
i.	Enhance commitment	1	2	3	4	5
4.	Leveraging Knowledge					
a.	<i>Knowledge Utilization</i>					
i.	Change methods	1	2	3	4	5
ii.	Try new way	1	2	3	4	5
iii.	Change procedures	1	2	3	4	5
iv.	Apply new knowledge	1	2	3	4	5
b.	<i>Knowledge Sharing</i>					
i.	Learn from each other	1	2	3	4	5
ii.	Exchange knowledge	1	2	3	4	5
iii.	Knowledge sharing easily	1	2	3	4	5
iv.	Knowledge sharing frequently	1	2	3	4	5
c.	<i>Knowledge Acquisition</i>					
i.	Improve knowledge	1	2	3	4	5
ii.	Develop new knowledge	1	2	3	4	5

iii.	Self-reflect	1	2	3	4	5
iv.	Improve competence	1	2	3	4	5
v.	Learn new knowledge	1	2	3	4	5
5.	Learning Capability					
a.	Knowledge Stocks					
i.	<i>Individual-level knowledge</i>					
	Being knowledgeable and qualified about work	1	2	3	4	5
	Have skills and competences for working properly	1	2	3	4	5
	Being aware of critical issues that affect work	1	2	3	4	5
	Feel confident about doing work	1	2	3	4	5
	Feel a sense of responsibility on work	1	2	3	4	5
ii.	<i>Group-level knowledge</i>					
	Develop a common knowledge about work	1	2	3	4	5
	Have capability to make decisions concerning work	1	2	3	4	5
	Have capability for effective conflict resolution	1	2	3	4	5
	Properly coordinate and organize their work	1	2	3	4	5
	Successes and failures shared within the groups	1	2	3	4	5
iii.	<i>Organizational-level knowledge</i>					
	Have a strategy that positions well its future	1	2	3	4	5
	Have a structure that allows working effectively	1	2	3	4	5
	Have management methods that allow working efficiently	1	2	3	4	5
	Have systems and documents containing worthy information	1	2	3	4	5
	Culture is properly distinctive	1	2	3	4	5
b.	Learning Flows					
i.	<i>Exploration</i>					
	Individual lessons learnt are exchanged within their work group	1	2	3	4	5
	Individuals share knowledge as they work within groups	1	2	3	4	5
	Individuals have input into the organization's decisions	1	2	3	4	5
	Organization puts in operation suggestions made by groups or individuals	1	2	3	4	5
	Organization do not "reinvent the wheel"	1	2	3	4	5
ii.	<i>Exploitation</i>					
	Policies and procedures guide individual work	1	2	3	4	5
	Internal training and work training are provided within the organization	1	2	3	4	5
	Interdisciplinary training, work rotation and special assignments are usual	1	2	3	4	5
	Individuals know and put in operation group decisions	1	2	3	4	5
	Past experiences influence on organizational future behaviour	1	2	3	4	5
"To what extent do you agree with the following items contributing to your organization's performance improvement? (1=strongly disagree; 5=strongly agree)."						
		strongly disagree		strongly agree		
6.	Performance Improvement					
a.	Extensive innovation in construction	1	2	3	4	5
b.	Extensive innovation in management	1	2	3	4	5
c.	Significant improvement in process	1	2	3	4	5
d.	Significant change in method	1	2	3	4	5
e.	Improve quality of performance	1	2	3	4	5
f.	Increase productivity	1	2	3	4	5

g.	Save costs	1	2	3	4	5
h.	Save time	1	2	3	4	5
i.	Get new project	1	2	3	4	5

Ibrahim Yitmen received his Ph.D. degree in Architecture (Building Science) in 2002 from Istanbul Technical University (ITU), Turkey. Dr. Yitmen who is currently an Associate Professor in the Department of Civil Engineering at the European University of Lefke (EUL), North Cyprus has 17 years of experience in construction engineering and management.. Dr. Yitmen is a research member of International Council of Research and Innovation in Building and Construction (CIB) since October 2005. He is also an active member of American Society of Engineering Management (ASEM) since June 2010. His research interests include Information Technology, Knowledge Management, Innovation, Organizational Learning, Organizational Change, Neural Networks Applications, Procurement Systems, Performance Improvement, and Culture in Construction. He is the program coordinator of the MSc. in Construction Management Program at EUL. He is also currently the Chairman of the Centre for Construction Innovation and Research which has recently been established at EUL. Dr. Yitmen has served as a program committee member for many international conferences on construction industry development.

Ibrahim Yitmen, doktora derecesini 2002 yılında İstanbul Teknik Üniversitesi Mimarlık Ana Bilim Dalı Yapı Bilgisi Doktora Programından aldı. Halen Lefke Avrupa Üniversitesi İnşaat Mühendisliği Bölümünde Doçent olan Yitmen'in Yapım Mühendisliği ve Yönetimi konusunda 17 yıllık bir tecrübesi bulunmaktadır. Dr. Yitmen 2005'den beri Yapı ve İnşaat Araştırma ve İnovasyon Uluslararası Konseyinde araştırma elemanı olarak çeşitli komitelerde yer almaktadır. Aynı zamanda Haziran 2010'dan beri Amerikan Mühendislik Yönetimi Derneği aktif üyesidir. Araştırma alanları Bilişim Teknolojileri, Bilgi Yönetimi, İnovasyon, Örgütsel Öğrenme, Örgütsel Değişim, Sinir Ağları Uygulamaları, Proje Temin Sistemleri, Performans İyileştirme, ve Kültür konularını kapsar. Halen LAÜ Yapımda İnovasyon Araştırma Merkezi Başkanlığını yapmakta olan Dr. Yitmen, inşaat sektörünün gelişimi üzerine birçok uluslararası konferansta organizasyon ve bilimsel komite üyesi olarak görev yapmıştır.