

*Full Length Research Paper*

# Comparison and grade analysis of the effective criteria in organizational learning by hierarchical analysis (AHP)

Abdollah Babaeinesami\* and Farshid Abdi

School of industrial Engineering, Islamic Azad University (IAU), South Tehran Branch, Iran.

Accepted 30 August, 2011

The aim of this research is to make a comparison and grade analysis of the effective criteria in organizational learning. The latter is fulfilled using analytical hierarchy process (AHP) among the staff of educating and training organizations in high school level. 111 staff of educating and training organizations (managers, deputies and teachers) were randomly chosen. Templeton method and other organizational learning questionnaires, comprising eight factors: awareness, communication, performance assessment, intellectual cultivation, environmental adaptability, social learning, intellectual capital management and organizational grafting, were used to collect data. Some well-known statistical and decision making software were used to analyze the data. As a result of using Templeton, Lewis and Snyder structural method with eight factors, the highest score is assigned to awareness and the lowest is assigned to organizational grafting. According to the research findings, increasing the awareness among the staff of educating and training organization leads to an increase in learning in the mentioned organization and consequently it proves considerably effective and prominent in higher performance of the organization.

**Key words:** Organizational learning, ranking, comparison, analytical hierarchy process (AHP).

## INTRODUCTION

The importance of study and analysis of organizational learning has increased in recent years, and several researchers have analyzed it from different approaches. Although, the studies in the field of organizational learning are vast, various aspects of this type of learning must be studied. Cyert and March were the first researchers who linked the two words, learning and organization and they presented the learning as an organizational phenomenon. With the aim of reaching the same definition for organizational learning and through studying and grouping more than 150 scientific texts in which the word "organizational learning" is used, Templeton et al. (2002) concluded that three paradigm demography (learning from personal and organizational

learning view), social actions (knowledge acquisition, information distribution and organizational memory), outcome perspective (planned changes, validating the content of information and organizational results) are used for organizational learning. Research in the field of organizational learning comprises researchers in different majors with different skills which includes organizational theories, organizational behavior, organizational and industrial psychology, strategic management and change management.

## Different descriptions of organizational learning

Senge (1990) introduced 5 groups of learner organizations which include: 1) Systematic thought 2) personal authority 3) intellectual models 4) common thoughts and 5) team learning. He also defined organizational learning as a constant experimental experience which

---

\*Corresponding author. E-mail: [abdollah\\_babae@ yahoo.com](mailto:abdollah_babae@ yahoo.com).  
Tel: +989359590323. +989353339696. Fax: +982177500506.

is transferred or changed into knowledge that is accessible to all organizations and their related missions. Garvin (2000) described that organizational learning as a learner organization, is an expert in creativity, acquisition, interpretation, transfer, knowledge acquisition and also in amending systematic behaviors to enable them to reflect the modern knowledge and insight. Alegre and Chiva (2008) described organizational learning as a process by which the organization learns and learning means any change in organizational models that leads to an improvement through maintaining the organizational performance. They described organizational learning capability based on capability definition, as a group of sources or tangible and intangible skills which are used by the organization to accomplish the new competitive advantages. Garcia-Morales et al. (2007) explain organizational learning as the capability of the organization to maintain and improve the performance based on the previous experience and they see this capability as the ability to acquire, benefit the explicit knowledge and to use it within the organization. Marchand (2000) described the organizational learning as the gradual learning process, so that the employees could learn through experience and cooperating with their own coworkers. According to Kululanga and Maccaffer (2001), organizational learning performs like a catalyzer to complete an organizational learning culture, and this type of learning culture can enhance the organizational learning systematically. Duncan and Weiss (1989) presented another description that emphasized more on the process and organizational learning knowledge without pointing to people. "Organizational learning is such a process in which the knowledge related to cause and effect of relationships is developing."

In marketing, like other cases, most of the informational learning studies were mainly conceptual and just recent years empirical studies were conducted in this field (Hult et al., 2000). As a result, in spite of numerous researches carried out in the field of cognitive map management, a general agreement on the meaning of organizational learning has not yet been reached and it is still in dispute (Lahtheenmaki et al., 2001).

### **Models and organizational learning patterns**

Organizational learning factors are learning elements whose resultant represent depth and extent of learning and contributes to more efficient understanding of learning process in the company.

Templeton et al. (2002) have designed a questionnaire according to the organizational learning definition in four dimensions of knowledge acquisition, information distribution, information interpretation and organizational memory and distributed it among 46 companies. They developed eight factors for organizational learning using factor analysis and specified each criteria assessment

factor (Table1). Lahteenmaki et al. (2001) compiled three factors according to the first segment of learning and second segment for organizational assessment.

The single loop learning occurs when the results are not equivalent to beliefs and hopes and this inequality leads to a change in strategy. The double loop learning occurs when inequality feedback in the results with beliefs leads to a change in beliefs in addition to a change in strategy. These three factors are capability in learning, collective setting of mission and strategy and creative creation of the future. Finally a criterion is assigned to each one (Table 2).

Goh and Richard (2005) compiled 5 factors for organizational learning assessment which are, clearness of mission and goals, efficiency, leadership commitment, experience, knowledge shifting and teamwork and group problem solving. They also determined each of their assessment criteria (Table 3).

### **Ranking organizational learning criteria**

Hierarchical analysis process is one of the most comprehensive designed systems for decision making with different criteria, this is so because this technique provides formulation of the problems in a hierarchical manner and it can also consider different quantitative and qualitative criteria in the problem. This process is able to enter the different choices of decision making and facilitate the process of sensitivity analysis on the criteria and sub constructs. It also shows the compatibility or incompatibility of this decision, which is one of the outstanding advantages of this technique in multipurpose decision making.

### **METHODOLOGY**

The experimental group of this research consisted of 111 people and they were gathered randomly among the educational staffs (managers, deputies and teachers) in high school level. A questionnaire was planned and distributed to them and 150 questionnaires were filled totally, among which 111 papers were used in analysis and the rest were omitted.

The basis of the given questionnaire in research was the organizational learning questionnaire of Templeton and his coworkers. Considering that the main organizational learning questionnaire of Templeton is designed for industrial organization surveys. In this research, the same 8 factors of Templeton organizational learning were applied, but the questions and the method were designed in a way that is suitable for educational staffs. The organizational learning questionnaire consists of 31 elements and eight factors (awareness, communication, performance assessment, intellectual cultivation, intellectual management, organizational grafting, environmental adaption, social learning). The answers can be grouped in 5 levels (strongly disagree, moderately disagree, undecided, moderately agree, strongly agree); if the first choice of "strongly disagree" is chosen, a score of 1 is assigned to the question and if the item "strongly agree" is chosen, a score of 5 is assigned to the question. But in the negative questions, the backward scoring is planned.

**Table 1.** Templeton's learning factors.

<b>Learning factor</b>	<b>Learning indices</b>
Awareness	Collecting information from within Directing information Analysis of information Information management system Using information
Communication	Using communicational tools Using electronic means Encouraging employees to communicate clearly
Performance assessment	Rules of managing information Storing information Guiding operations by means of stored information Encouraging the use of frameworks and models
Intellectual cultivation	Employees training Collecting information from outside Developing experts Management learning by direct observation
Environment adaptability	Fast reaction to technological change Using electronic memory Use of IS Using archived information
Social Learning	Employees resistance toward new ways Keeping information and plans from other employees Learning about developments
Intellectual capital management	Using employees with multifarious skills Acquiring subunits based on short term financial gain Hiring highly specialized or knowledgeable personnel
Organizational grafting	Accepting strategies of competitors Acquiring capabilities from outside

**Table 2.** Lahteenmaki's learning factors.

<b>Learning factor</b>	<b>Learning indices</b>
Creating ability to learn	Positive tendency toward taking risks Open discussion Tendency to personal development Challenging and meaningful job [Initial/ First] factors of changing Encouragement for being active at work The least personal stress Commitment toward charging

**Table 2.** Contd.

Collective setting of mission and strategies	Awareness of organizational purposes Commitment toward purposes Active cooperation in decision making Ability to cooperate Effective decision making Effective way of transferring information
Collective creation of the future	Ability to benefit from team work Empirical culture Effective strategic plan Smooth working Management support to develop personnel

**Table 3.** Goh and Richard's learning factors.

<b>Learning factor</b>	<b>Learning indices</b>
Clearness of missions and goals	Supporting and accepting the organizational statement Unawareness of how a mission is performed Clarity of organizational values Opportunities for personal assessment by gaining goals
Leadership ability and commitment	Being afraid of new ideas by management and resisting Creating common purposes among management to perform better Creating atmospheres to criticize the management Creating a feedback atmosphere for recognizing opportunities and problems with management Entangling employees in management decision making
Experience	Bringing up new ideas Encouragement for asking questions Bonuses for new ideas Attracting new ideas by management
Knowledge transferring	Opportunities to talk about the causes of success No discussion about failures Sharing profitable activities Opportunities to learn from others
Team work and joint problem solving	Solving problems collectively through talking with management Making problem solving groups Making groups for solving problems within

**Validity and reliability**

In organizational learning questionnaire, the reliability ratio of this questionnaire is 0.830, and since many researchers have used this instrument, its validity has been shown.

**RESULTS**

In this study, comparison and ranking of the factors and

effective criteria on organizational learning of Templeton model was done by one of decision making programs (Table 4). Table 4 shows the contents of sub criteria and other relative indices with special codes that make it possible to measure the weight of criteria and indices using the program.

As shown in Table 5, awareness, communication, performance assessment, intellectual cultivation, intellectual management, organizational grafting, environmental

**Table 4.** Contents of sub criteria and other relative indices with special codes.

<b>Learning factor</b>	<b>learning indices*</b>
Awareness	A1, A2, A3, A4, A5
Communication	B1, B2, B3
Performance assessment	C1, C2, C3, C4
Intellectual cultivation	D1, D2, D3, D4
Environment adaptability	E1, E2, E3, E4
Social Learning	F1, F2, F3
Intellectual capital management	G1, G2, G3
Organizational grafting	H1, H2

\*learning indices: A1, collecting information from within; A2, directing information; A3, analysis of information; A4, information management system; B1, using communicational tools; B2, using electronic means; B3, encouraging employees to communicate clearly; C1, rules of managing information; C2, storing information; C3, guiding operations by means of stored information; C4, encouraging the use of frameworks and models D1, employees training; D2, collecting information from outside; D3, developing experts; D4, management learning by direct observation; E1, fast reaction to technological change; E2, using electronic memory; E3, use of IS; E4, using archived information; F1, employees resistance toward new ways; F2, keeping information and plans from other employees; F3, learning about developments; G1, using employees with a criteria mix of skills; G2, acquiring subunits based on short term financial gain; G3, hiring highly specialized or knowledgeable personnel; H1, accepting strategies of competitors; H2, acquiring capabilities from outside.

**Table 5.** Paired comparison of criteria and weights of each element.

	<b>Awareness</b>	<b>Communication</b>	<b>Performance assessment</b>	<b>Intellectual cultivation</b>	<b>Environment adaptability</b>	<b>Social learning</b>	<b>Intellectual capital management</b>	<b>Organizational grafting</b>	<b>Preference</b>
Awareness	*	4.2	1.14	1	1.94	5.14	4.67	8.54	0.229
Communication	-	*	0.24	0.23	0.3	1.94	1.47	5.34	0.064
Performance assessment	-	-	*	0.87	1.8	5	4.53	8.4	0.213
Intellectual cultivation	-	-	-	*	1.94	5.14	4.53	8.54	0.228
Environment adaptability	-	-	-	*	4.2	*	3.73	7.6	0.150
Social learning	-	-	-	-	-	*	1.57	4.4	0.043
Intellectual capital Management	-	-	-	-	-	-	-	*	4.87
Organizational grafting	-	-	-	-	-	-	-	-	*

Incompatibility rate = 0.02

**Table 6.** The relative weight resulted from sub criteria.

	Weight to Awareness	Weight to Communication	Weight Performance assessment	Weight to Intellectual cultivation	Weight to Environment adaptability	Weight to Social learning	Weight to Intellectual capital	Weight to Organizational grafting
A1	0.254	*	*	*	*	*	*	*
A2	0.177	*	*	*	*	*	*	*
A3	0.254	*	*	*	*	*	*	*
A4	0.158	*	*	*	*	*	*	*
A5	0.158	*	*	*	*	*	*	*
B1	*	0.339	*	*	*	*	*	*
B2	*	0.402	*	*	*	*	*	*
B3	*	0.259	*	*	*	*	*	*
C1	*	*	0.303	*	*	*	*	*
C2	*	*	0.256	*	*	*	*	*
C3	*	*	0.214	*	*	*	*	*
C4	*	*	0.226	*	*	*	*	*
D1	*	*	*	0.234	*	*	*	*
D2	*	*	*	0.250	*	*	*	*
D3	*	*	*	0.265	*	*	*	*
D4	*	*	*	0.250	*	*	*	*
E1	*	*	*	*	0.231	*	*	*
E2	*	*	*	*	0.298	*	*	*
E3	*	*	*	*	0.215	*	*	*
E4	*	*	*	*	0.256	*	*	*
F1	*	*	*	*	*	0.377	*	*
F2	*	*	*	*	*	0.268	*	*
F3	*	*	*	*	*	0.355	*	*
G1	*	*	*	*	*	*	0.427	*
G2	*	*	*	*	*	*	0.263	*
G3	*	*	*	*	*	*	0.310	*
H1	*	*	*	*	*	*	*	0.545
H2	*	*	*	*	*	*	*	0.455

adaption, social learning are presented in the order of priority. In this table "awareness" owned the highest grade and the lowest grade is assigned to organizational grafting.

This study obtained the relative weight of sub

criteria by making matrixes of paired comparison for sub criteria in relation with each of the criteria In order to find the relative weight of sub criteria in relation with criteria.

As shown in Table 6, A1 and A3 have the

highest rate in terms of awareness and A4 and A5 have the lowest rank in communication criteria. B2 has the highest rank and B3 has the lowest rank. In criteria of performance assessment, the highest rank got C1 and C3 got the lowest rank. In criteria

of intellectual cultivation D3 has the highest rank and D1 has the lowest rank. In the criteria of environmental adaptability E2 has the highest and E3 has the lowest rank. In the criteria of social learning, F1 has the highest rank and F2 has the lowest rank.

In the criteria of intellectual capital management, G1 has the highest rank and G2 has the lowest rank; and in organizational grafting H2 has the highest rank and H2 has the lowest rank.

## Conclusion

The results of the present study show that, among indices of organizational learning, awareness is the most effective and important. And according to the other factors of organizational learning, if employment awareness is increased, organizational learning will rise and as a result the ability of organization will increase. This also will have positive effects on the operation of organization.

The results imply that organizational learning is measurable by the eight mentioned dimensions. This model could be used by managers to improve organizational learning capability.

## REFERENCES

- Alegre J, Chiva R (2008). Assessing the Impact of Organizational Learning Capability on Product Innovation Performance: An Empirical Test. *J. Technovation*, 28: 315-326.
- Duncan R, weiss A (1989). Organizational learning: Implications for organizational design. *J. Res. Organ. Behav.*, 1: 75-123.
- García-Morales V, Llorens-Montes FJ, Verdu-Jover AJ (2007). Influence of personal mastery on organizational performance through organizational learning and innovation in large firms and SMEs. *J. Technovation*, 27: 547-568.
- Goh ALS (2005). Harnessing knowledge for innovation: An integrated management framework. *J. Knowl. Manag.*, 9(4): 6-18.
- Hult GTM, Hurley RF, Giunipero LC, Nichols Jr (2000). Organizational learning in global purchasing: A model and test of internal users and corporate buyers. *J. Decis. Sci.*, 31(Spring): 293-325.
- Kululanga GK, Edum-Fotwe FT, McCaffer R (2001). Measuring construction contractors' organizational learning. *J. Build. Res. Inform.*, 29(1): 21-29.
- Lahteenmaki S, Toivonen J, Mattila M (2001). Critical Aspects of Organizational Learning Research and Proposals for Its Measurement. *J. Manag. Inform. Syst.*, 12: 113-129.
- Marchand DA, Kettinger WJ, Rollins JD (2000). Information orientation: People, technology and the bottom Line. *MIT SMR.*, 41(4): 69-80.
- Senge PM (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.
- Templeton GF, Lewis BR, Snyder CA (2002). Development of a Measure for the Organizational Learning Construct. *J. Manag. Inform. Syst.*, 19(2): 175-218.