

PREDICTION OF KNOWLEDGE MANAGEMENT BASED ON THE ORGANIZATIONAL LEARNING AND ITS DIMENSIONS AT AMIRKABIR UNIVERSITY OF TECHNOLOGY

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ABSTRACT

The aim of this research is to study the prediction of knowledge management based on the Organizational learning and its dimensions at Amirkabir University of Technology. The statistical population of this study consists of all employees at Amirkabir University of technology in 2010. The statistical sample covers 140 administrative employees at Amirkabir University of technology and they are selected according to Morgan table and random stratified sampling method. Karen E. Watkins and Victoria J. Marsick s' Organizational learning questionnaire (2002) and researcher-made knowledge management questionnaire are the data collection tools in this study. The amount of alpha coefficient is equal to 0.97 for Organizational learning and 0.97 for knowledge management questionnaire; thus they are more than 0.70, the research measurement tool is reliable. According to the results of linear regression, there is a significant correlation between the Organizational learning and its dimensions in managers with knowledge management.

The linear regression equations are as follows:

$y = 25.228$ (Organizational learning)

$y = 0.35$ (group level) + 0.66 (Individual level)

Keywords: *Knowledge Management, Organizational Learning*

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INTRODUCTION

During the past few years, numerous discussions have been raised on the importance of knowledge management throughout the world. The professors and researchers in different field such as sociology, economics and management agree that a development is occurred. The knowledge management and associated strategic concepts are among the main and essential components for organizations and are promoted to survive and maintain the competitive power. The emergence and spread of information and knowledge management owe the conducted studies on the management of organizations on the one hand, and are resulted from the leading organizations' tendencies towards establishing the mentioned systems and their efforts to refine and adapt these systems in practical ways with conditions and requirements of internal and external environment of organization on the other hand (Afzalian, 2013).

Gandhi: "The knowledge management is the efforts to transform the employees' knowledge (human capital) to the joint asset of organization (structural intellectual capital) (Gandhi, 2004).

The knowledge management is a joint purpose and process which takes steps as a target or result in sharing the information in the organization (Clarke and Rollo, 2013).

According to Davenport and Prusak's view, the knowledge management seeks the following objectives:

1- Developing the specific strategies to achieve the Ad hoc exchanges: The knowledge exchange can be achieved through participation in knowledge and establishing the student-teacher relationship, 2- Accelerating the knowledge transfer, 3- Converting the knowledge management into a part of employees through doing the full time by leaning staff and this can be changed to a pervasive phenomenon, 4- Creating a sort of wonderful organizational culture, so the knowledge freely and easily governs the organization, 5- Knowledge management implements the new and interesting affairs, 6- Knowledge management organizes the certain forms of knowledge and improves the particular activities, 7-

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Knowledge management dominates the application of project, and change and technology management (Kheirandish, 2009).

In fact, the effective knowledge management leads to an reduction in errors and reworks, enhanced problem solving and decision making, reduced the costs, higher devolution to members, more effective relationships and better service to customers, and compensates the human resources managers' concerns about the individual retirement and the lack of professionals as well as reducing the rate of fraud and corruption (Afzalian, 2013).

The knowledge management tools have properly played their roles in supporting the knowledge management system and these roles include knowledge acquirement, generation, collection and application.

The way the managers implement the knowledge management is what differentiates the organizations in the third millennium from the past.

Peng (2013) investigated in his study the time and reason for concealing the knowledge by employees? Data of 190 knowledge employees is collected through a web-based survey in China. The hierarchy regression models and bootstrap method are applied for testing the hypotheses. The results indicate that there is a knowledge concealing-based psychological motivation in employees. Furthermore, the results indicate that the organizations should utilize the methods, by which the employees are able to better understand themselves and their organizations and make their knowledge available for organization, in order to enhance the employees' mental motivation for dissemination of knowledge.

Hon and Wang (2009) conducted a research entitled as the "Challenges to knowledge management systems" in the field of challenges to organizational knowledge processing. The results of test indicate that a knowledge management system, which supports the aim of knowledge creation, should be designed for problem solving because such this system can implement the sudden and frequent processes; in contrast for convergent knowledge processing, a management system is effective with preselected and acceptable objectives and the ability to analyze the capabilities accurately.

In a research entitled as the "Experimental studies on knowledge management and innovative performance, Xu and Li (2009) indicate that the knowledge sharing and creation have a significant relationship with innovation performance.

Afzalian investigated the status of knowledge management in education system of Iran. The research has descriptive-survey method and the statistical population of study covers all education system experts in Iran. Based on targeting sampling system, the sample size is equal to 120 and the questionnaire is a tool for data collection with reliability of 90%. The research data analysis is done at both inferential and descriptive statistical levels and through the Student's t and Friedman tests. The results of research indicate that among the factors affecting the knowledge management, the knowledge storage, knowledge application and information technology are at the desired levels, but the factors such as knowledge creation, knowledge sharing, organizational culture and human resources are at the unsatisfactory level, and also the results indicate that the knowledge management state is not appropriate in education system of Iran (Afzalian, 2013). Shami (2010) has introduced a model for knowledge sharing in projects based on their features through the exploratory integrated method. In this model, eight predicting variables (project features) and five criterion variables (dimensions of knowledge sharing) are identified and totally 22 relationships are discovered among these dimensions. Then, the generalizability of designed model is investigated in the form of formulated hypothesis test in qualitative section. Finally, 19 out of 22 relationships are locally identified; some of them are as follows: the relationship between knowledge sharing and project nature, dispersion of project bases, formality of project, conservative management of project, outsourcing of plan projects, membership of plan, as well as the relationship between the knowledge sharing strategy and plan membership In a climate of accelerating change, organizations can not flourish without nurturing the seeds of learning. Established as a wellspring of value-producing knowledge, organizational learning is bulding block to innovative, quality, and profitable products and services (Argyris. and Schon, 1996), (Barghi *et al.*, 2012) and (Senge, 1990). Organizational learning means the process of improving actions through better knowledge and understanding (Fio and Lyles,

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1985), King (2002) asserted that organizational learning is important to the success of quality-focused organizations since only through learning can organizations capture and retain the knowledge necessary to continually refine and improve business processes responsible for product and service quality. One of the obstacles in institutionalizing organizational learning is believed to be the lack of effective leadership (Joeong, 2004), (Bai *et al.*, 2013) and (Beard, 2006), Organizations ought to take into account the way leaders educate the staffs regarding the role of organizational learning. Leaders should create an atmosphere in which organizational learning is institutionalized in the organization. This can, finally, lead knowledge and information systems, which are of determining factors in any organization, into organizational learning under the leaders' support. Senge (Templeton *et al.*, 2002), identifies the five disciplines associated with the organizational learning to be personal mastery, mental models, systems thinking, team learning, and building a shared vision for the organization. Organizational learning culture refers to "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights" (Garvin, 1993). Supervisor developmental feedback provides valuable information to employees and enables the employees to learn, develop, and make improvements on the job (Widen and Ginman, 2004), Scholars holding the social interaction view argue that organizational learning emerge amid the social interactions of employees. Senge (Widen and Ginman, 2004), emphasized the interaction among employees on the base of personal mastery in his concept of organizational learning. Cook and Yanow (Cook *et al.*, 1993), suggested that organizational learning is a formal or informal collective process of exploration and practice, and it is a cultural phenomenon. They emphasized that organizational learning is a phenomenon of collective learning. Organizational learning is related to change, innovation, technology and product development, and organization profit, continual progress in these areas enables the organization to reinvent itself and avoid stagnation (Argyris and Schon, 1996), (Handy, 1996), (Fio and Lyles, 1985), (Nordtvedt, 2005) Crossan *et al.*, (1999), proposed an organizational learning framework with four processes – intuiting, interpreting, integrating and institutionalizing; these processes link the individual, group and organizational levels. Watkins and Marsick's (Widen and Ginman, 2004), (Watkins and Marsick, 1996), identify seven core practices at the individual, group, and organizational levels as follows:

1. Individual level

- Creating continuous learning opportunities
- Promoting inquiry and dialogue

2. Team/group level

- Encouraging collaboration and team learning

3. Organizational level

- Creating systems to capture and share learning
- Empowering people toward a collective vision
- Connecting the organization to its environment
- Providing strategic leadership for learning

MATERIALS AND METHODS

Research Method

This research has descriptive-correlative type. In correlative research, the managers' Organizational learning is investigated according to the dependent variable.

Statistical Population, Sample and Sampling Method

The statistical population of this study consists of all employees at Amirkabir University of technology in 2010.

The statistical sample of this study consists of 140 administrative employees at Amirkabir University of technology and they are selected using Morgan Table and through stratified random sampling.

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Research Tools

Karen E. Watkins and Victoria J. Marsick s' Organizational learning questionnaire (2002)

The researcher-made standardized questionnaire is applied to collect the required data for this study and its responses have five options and range from never to forever. The questionnaire consists of 73 questions and includes the questions related to the managers' Organizational learning and knowledge management. The research measurement tool includes Karen E. Watkins and Victoria J. Marsick s' Organizational learning questionnaire (2002) and the researcher-made knowledge management questionnaire including 43 items questions of leadership management (questions 31 to 36), teamwork dimensions (questions 37 to 40), and knowledge sharing (questions 41 and 43) dimensions.

Reliability and Validity

Watkins and Marsick s' Organizational learning questionnaire (2002) and researcher-made knowledge management questionnaire are the data collection tools in this research. The reliability of tools is measured through Cronbach's alpha. The alpha coefficient is equal to 0.97 for Organizational learning tool and equal to 0.97 for knowledge management; since they are above 0.70, it indicates the reliability of measurement tool in this study. For validity measurement, the tools are available to advisor and supervisor professors and three educational administration professors, and the validity is confirmed performing the modification

RESULTS AND DISCUSSION

Results

Table 1: Descriptive statistics of "organizational learning" dimensions

	Organizational learning	Personal level	Group level	Organizational level
Mean	113.0421	37.9182	16.6142	54.0463
Median	112.0000	37.0000	16.0000	49.0000
Mode	120.00	49.00	12:00	34.00
Standard deviation	33.81864	11.28459	5.13786	17.85894
Skewness	0.424	0.210	0.297	0.499
Kurtosis	-0.442	-0.544	-0.447	-0.616
Minimum	44.00	15.00	6.00	22.00
Maximum	206.00	69.00	30.00	102.00
Total score	10739.00	4171.00	2110.00	5837.00

As presented, the organizational learning dimensions tend to a normal distribution due to the proximity of central indices.

Research Question: Is there a correlation between the organizational learning and knowledge management?

The regression is utilized to answer the research question of whether there is a correlation between knowledge management and organizational learning. The regression model and its equation are presented in the following table.

Table 2: Summary of regression model and its equation

Correlation coefficient	Square of correlation coefficient	Square of adjusted correlation coefficient	Standard error of approximation
0.828	0.685	0.681	19.18457

Table 2 shows the correlation coefficient, square of correlation coefficient or the coefficient of determination, so that there is a high correlation between these variables equal to 0.82. Furthermore, the

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coefficient of determination indicates that 68 percent of changes in knowledge management as the dependent variable is covered by the organizational learning as the independent variable.

Table 3: Summary of regression model and its equation

	Sum squares	of Degrees of freedom	Mean square	F	Significance level
Regression	60871.217	1	60871.217	165.390	0.000
Residual	27971.616	76	368.048		
Total	88842.833	77			

The significant level presented in the table above allows the analysis of regression model since it is below 0.05.

Table 4: Regression between organizational learning and knowledge management

Independent variable	Non-standardized coefficients		Standardized coefficients	t	Significance level
	B	Standard error	Beta		
Constant value	29.755	7.358		4.044	0.000
Organizational learning	0.791	0.061	0.828	12.860	0.000

The correlation between organizational learning and knowledge management is equal to 0.82 and the coefficient of determination equal to 0.68 and the regression equation is statistically significant according to the significant level of 0.000 and f equal to 165.39. More precisely, 68% of changes in knowledge management as the dependent variable are covered by the organizational learning as the independent variable. The obtained beta in regression is equal to 0.82 for organizational learning variable.

$y = 0.82$ (organizational learning)

The regression is utilized to answer the research question about whether there is a correlation between dimensions of organizational learning and knowledge management. The regression model and its equation are presented in the following table.

Table 5: Summary of regression model and its equation

Correlation coefficient	Square of coefficient	correlation	Square of correlation coefficient	adjusted	Standard error of approximation
0.862	0.743		0.733		17.56597

Table 5 shows the correlation coefficient, square of correlation coefficient or the coefficient of determination, so that there is a high correlation between these variables equal to 0.86. Furthermore, the coefficient of determination indicates that 74 percent of changes in knowledge management as the dependent variable is covered by dimensions of organizational learning as the independent variable.

Table 14: Summary of regression model and its equation

	Sum squares	of Degrees of freedom	Mean square	F	Significance level
Regression	66009.159	3	22003.053	71.308	0.000
Residual	22833.674	74	308.563		
Total	88842.833	77			

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The significant level presented in the table above allows the analysis of regression model since it is below 0.05.

Table 6: Regression between dimensions of organizational learning and knowledge management

Independent variable	Non-standardized coefficients		Standardized coefficients	t	Significance level
	B	Standard error	Beta		
Constant value	25.228	6.864		3.676	0.000
Personal level	1.885	0.441	0.663	4.278	0.000
Group level	2.300	1.101	0.352	2.089	0.040
Organizational level	-0.270	.265	-0.149	-1.017	0.313

The correlation between dimensions of organizational learning and knowledge management is equal to 0.86 and the coefficient of determination equal to 0.74 and the regression equation is statistically significant according to the significant level of 0.000 and f equal to 3.71. More precisely, 74% of changes in knowledge management as the dependent variable are covered by dimensions of organizational learning as the independent variable. The obtained beta in regression is equal to 0.66 for personal level and 0.30 for group level and is insignificant for organizational level.

$y = 0.66 \text{ (personal level)} + 0.35 \text{ (group level)}$

Discussion

According to the second finding of this study, there is a significant correlation between the organizational learning and knowledge management and this research is along with the research findings by those such as Morali *et al.*, (2005) who conducted a case study on the way of utilizing WIKI in collaborative and supportive activities in a knowledge management class in information systems and at technology schools; Lahijanian (2005) came to conclusion of establishing the knowledge management training programs and courses to increase the managers, employees and students' knowledge and skills in higher education centers. In the field of organizational studies and business administration, Nadi (2007) and Semmel and Dianne (2002) have increasing focused on the performance of knowledge management, production process, coding and change and transformation of information assets to enhance the organizational performance. Arbab (2002) conducted a case study with the aim at building a model for assessment and introduction of factors affecting the knowledge creation and development. Gholami (2006), (2003) held a conference in Faculty of management and economics at Sharif University of Technology and the data analysis indicates that the participants' mean responses are less than the average in all six sub-scales associated with the knowledge management establishment. Reza (1995) has considered the utilization of ICT in education, which leads to the efficiency and self-reliance in human resources, as one of the success factors of knowledge management in acquisition of competitive advantage. Edward (2004) conducted a descriptive-quantitative study on determining the rate and effectiveness of knowledge management in improving the decision making and planning in various higher education organizations. Wagner (2004) aimed at utilizing WIKI technology to increase the learners' abilities to learn the design management, and development and implementation of information technology operations in knowledge management. Jeffery (2004) concluded that the knowledge life cycle is an effective framework in determining the general lines of organizational learning. "Thomas Allen" (1994) promoted this idea that the knowledge belongs to no one, but the whole company, and this situation is the result of knowledge sharing culture. Ferguson and Weckert (2005) have investigated a range of software presented as the knowledge management systems. "Baltazard" and "Cole" have concluded that the organizational philosophy and prior values play the roles in the success or failure of knowledge management. The existence of clear and flexible structures and procedures and the work teams can enhance the interest in organizational learning and processes of knowledge management.

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According to the "information program of IT development at Australian schools" (2002), which is codified by the Department of Education in Australia, all state agencies are obliged to apply all their financial facilities to achieve the objectives of program. Davenport *et al.*, (1995) aimed at utilizing the available experiments in the field of designing to solve the new problems.

Marsh and Jones (2002) have studied the knowledge management in the Australian Defence organizations and classified it into four major categories of organizational culture, technology, learning and structural aspects. Nonaka and Takeuchi provided the ideal slogans for all groups involved in the design and development.

Dave and Tom (2009) conducted a research for those who seek for practical applications of knowledge management tools and skills. Ponnappa (2008) studied the organizational learning and understanding to create the systems for educational institutions. Irani and Amir (2009) investigated the knowledge management planning and organizational training in favor of institutional memory. Javernik (2009) has concluded that the knowledge management issue is still rough at multiple organizational levels through the level ontology under uniform method despite the knowledge management maturity, facilitated knowledge creation and sharing it at multiple levels (personal, group, organizational and international). Blankenship and Berak (2008) concluded that there is a need for more complex education methods based on the culture and interaction in order to retain the knowledge and this is not easily recorded.

Terry *et al.*, (2008) have conducted a research as a framework for increasing the organizational learning and its work elements differ in terms of the location and work.

Wolf (2007) has proposed that the use of educational space in any real job leads to learning a part of work. Chuan *et al.*, (2007) have suggested that the assessment of information system is a complex trend due to the numerous interaction factors which are maximum in costs, benefits and risks for human or organizational dimensions. Saman (2006) has concluded that the measurable reason and evidence of auditing era starts in development of organizations and they teach the other sectors the way of measuring and providing the results. Prior to determination of what is measured, the organizations should examine their internal knowledge. Martis (2006) provided a method for designing the measurement and structural model of intellectual capital: An exploratory experimental study is conducted for understanding the use of knowledge-based intellectual capital in an organization. Grey and Darren (2006) have provided the knowledge sourcing methods and concluded that the knowledge management (KM) initiatives in organizations seek to improve the employees' way of achieving the skills, experience, knowledge and belief and it is called the knowledge sourcing behavior. Hans (2005) studied the use of practical knowledge management tool in software consulting company and the management tools and technical skills in most of the companies. Rajiv and Sanjiv (2005) conducted a research on the empirical support of theoretical discussion and it involved in developing the possible framework of KM usefulness efforts. Lin *et al.*, (2010) developed a method for learning the relationship between these two groups and operational development such as planning, dividing and integrating. Badek (2010) introduced the research magic: (1) follow a purpose, (2) build a plan, (3) improve the tools, and (4) learn the evaluation.

1- The research results confirmed the positive effect of knowledge management on the employee performance improvement.

2- It seems essential to improve the IT status in most of the university units. It considers holding the training courses and making the required software and hardware infrastructure, so that some of the employees have been unable to work with even easiest types of computer software.

3- Unfortunately, the knowledge management is not institutionalized in most of the university sectors yet, and thus it seems essential to consider such this phenomenon in huge set of university.

4- The research and knowledge-based decision should be made and its transfer to subsets should be strengthened.

5- The main elements of knowledge management should be institutionalized in theoretical and practical education cycle in order to make the actual form of knowledge in acceptable and transferable standards to current and future needs at the university.

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- 6- Improving the applied training, in-service, short-term or long-term training courses for sustainability and establishment of knowledge process at the university.
 - 7- Despite the positive obtained results, it seems essential to make the managers and employees familiar with mentioned issue.
 - 8- Establishing better reward and encouragement system to develop the knowledge level in each sector such as sharing the experiences, technical knowledge and knowledge findings in target and other sectors.
 - 9- The continuous review of knowledge management systems and constant evaluation should be enhanced at different levels.
 - 10- The employees have been the main target of this research and thus it is suggested applying the knowledge management methods with regard to the rapid changes in the current era and competition in all organizations, educational institutions and universities throughout the country.
- Nowadays, the communities and organizations seek to obtain a sustainable competitive advantage. In this regard, the knowledge management is a useful tool for organizations and higher education institutions to develop the intellectual capital, encourage the innovation, and maximize the optimal performance. In an era of science and technology progress, when the organization is being changed, the human resources' utilization of information, educational techniques and strategies is not merely sufficient, but it seems essential to make the timely use of information and training environment. The knowledge flow includes the data hierarchy, information, knowledge and wisdom; and four elements of knowledge management, namely the knowledge, management, information technology and organizational culture, play the significant roles in its success or failure.

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