Investigating the Knowledge Management Implementation in Distance Education System in Iran

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Abstract

This study intends to ascertain the amount of basic infrastructures' readiness to implement the knowledge management system (culture and human factors, structure and processes, technical infrastructure) and rank these elements based on their importance in Payame Noor University of Mashhad. It is a survey research and the technique which has been applied is descriptive. The statistical population of research is the faculty members of Payame Noor university of Mashhad. The whole faculty members' opinions have been studied and the required data has been assembled through questionnaires. The questions, which have been formed the questionnaire, have been designed on the basis of Hurbert Rampersad questionnaire. The findings of the research indicate that Payame Noor University of Mashhad is not ready for the application of knowledge management in different dimensions of 'culture and human factors', 'information technology infrastructure' and 'structure and processes'. The results of ranking test (Friedman test) also show that 'culture and human factors' is the most and 'structure and processes' is the least important element.

Keywords: Culture and human factors, knowledge management, Payame Noor University of Mashhad, technical infrastructure, structure and processes.

1. Introduction

Universities are today at their 'third stream' or 'third mission', This term refers to the various roles of universities such as economic improvement in addition to two traditional roles of educating and researching (Rossi, 2010). Therefore, universities try as hard as they can to improve and augment the intellectual capital through benefiting from the existing resources. Not only are these resources consisting of information resources, but also they include intellectual powers and human resources and it is required to recognize and gain advantage from them through the appropriate techniques of management (Hazeri & Sarafzadeh, 2006). Knowledge management, as a more apposite instrument and through managing the explicit and implicit properties of organizations' knowledge, is an indication of ample studying in this field and can get access to the novel objectives of universities in the knowledge era besides the traditional goals of educating and researching.

It should be noticed that universities are the pivotal centers of engendering and disseminating of knowledge and also the vital resources of social improvements (Tian *et al.* 2009). Therefore, if knowledge management is not applied in the universities, most founts of intellectual capital and scientific products will be dwindled away on a massive scale. Additionally, paucity of retaining the tacit knowledge and assembled information during the process of accomplishing scientific researches, projects and experiences has made this equipment inaccessible for others. If the existing knowledge cannot be gathered and retained, it is not manageable in other times and places and this deficiency will bring about economic losses for the university in consequence of the fact that the university have to purchase the existing knowledge just because of lack of awareness of having the same knowledge or inability of getting access to it. Time which is wasted to achieve the knowledge is also as valuable as the financial expenses. Besides, if knowledge cannot be assembled inside the universities, this chance may be left for the unethical opportunists and private publishers outside the universities area to publish the same work.

It is an axiom that globalization and the development of communications and exchange of information can facilitate the process of transferring data and knowledge and also help the universities in the direction of improving and entering the universal community (Yadegarzadeh *et al.* 2007). This innovation can be an auspicious beginning for the knowledge management and better performance of resources in the future to achieve more efficiency, competence and innovation in the universities.

Due to the present conditions, the available organizations have great dissimilarities with the past. The most fundamental feature of 21th organizations is their emphasis on knowledge and information. In opposition to the past organizations, the present ones possess the advanced technology, require conquest, management and follow up the infinite changes. Knowledge is a powerful instrument to make changes and innovations throughout the world in which the new organizations are more interested (Mohammadifateh *et al.* 2008).

Knowledge, as an organization's property and a competitive advantage, has made it possible for the organizations to compete with each other with aplomb and remain in this field with the help of this strategic resource. "The importance of knowledge and its applications have been discussed in different dimensions; for example it is considered as an instrument for the comprehensive implementation and fair distribution of income from the viewpoint of sociologists, it has been discussed as the key feature of stability, success and consistent competitive advantages from the perspective of organization and management, and in economics, it has been adverted as a strategic asset (Niaz Azary & Amuei, 2007), in the way that nowadays economics has been transformed into a knowledge-based economics in which 1) knowledge is considered in economics as the pivotal source prior to other elements of natural resources or capital in the industrial economics; 2) the implicit properties, services and brands are the factors more important than explicit properties for the modern organizations' success; 3) world is a network which is advocated by the advanced communicative technologies and makes it feasible for knowledge to be passed across the borders (Cantner *et al.* 2009).

Some resolutions have been proposed to gain more advantage of knowledge. In this direction, knowledge management has been introduced as the most beneficial duty of the organizations for management and the application of this vital resource, also a novel perspective for taking advantage and the improvement of implicit properties. Knowledge management's emphasis is mainly on some activities such as recognizing, gaining, engendering, retaining, sharing and applying the knowledge by people and groups in the organization (Sun, 2010). Considering what was mentioned, Wen (2009) defines "knowledge management as a collection of procedures for engendering, gaining, sharing and applying knowledge to promote the organizational performance".

Owing to the fact that measurement is the prerequisite for the performance improvement, an apposite scale framework is specifically required for measuring the organization's status from the viewpoint of its readiness in the field of knowledge management. The organization's readiness for knowledge management signifies its readiness in whole dimensions of recognizing, assembling, organizing, retaining, disseminating and sharing knowledge in the organization (Dastrang *et al.* 2011). Therefore, the assessment of organization's readiness for knowledge management includes the recognition of present status of knowledge management in the adverted dimensions and the recognition of required changes for the augmentation of organization's capabilities of knowledge management. Additionally, the assessment of a system prior to its establishment can be considerably helpful in diminishing the plan's risks and staffs' resistance against the changes.

Considering the experts' and researchers' studies and remarks in the field of knowledge management, it seems that among various important factors, three ones are more significant in getting success in executing knowledge management which are as follows: "technology", "organizational culture" and organizational structure". Mills and Smith (2011) say, "These infrastructures have principal effect on the organizational performance and innovation".

Information technology, as a main effective element in knowledge management, facilitates the process of engendering, sharing, retaining and applying knowledge in the organization (Lee and Lee, 2007). It also affects knowledge management in two following ways: 1) Appropriate technology should be applied to get access to an effective knowledge management. 2) Organizational structures should be simplified to enhance the effectiveness of knowledge management (Aujirapongpan *et al.* 2010).

Organizational culture is another main infrastructure in executing knowledge management. Organizational management is a collection of values, beliefs, norms, perceptions and procedures in which the organizations' people are analogous. An effective organizational culture has a great influence on producing a suitable condition of exchanging and advocating the knowledge activities in the organization (Allameh *et al.* 2011). Some other factors such as the organizations' capability of learning, organizational memory's improvement and sharing knowledge among them are all dependent upon culture (Mills & Smith, 2011).

Other fundamental element in applying knowledge management in the organizations is organizational structure. In various dimensions, organizational structure can assist knowledge management in accomplishing its objectives. Organizational structure affects the processes of both knowledge management and organizational management (Aujirapongpan *et al.* 2010) and makes communications more feasible, facilitates the dissemination of knowledge

and creates the culture of disseminating knowledge inside the organization. Organizational structure is effectual in establishing knowledge management group; therefore, applying reasonable strategies in the direction of knowledge management purposes, and designing correspondent organizational structure can be very beneficial to succeed in accomplishing the knowledge management plan.

Due to the fact that universities, based on their size, scope and variety of intellectual capitals, are the most widespread and formal social institutions, knowledge management is required of them to achieve more impressive producing, sharing, organizing and using information resources, knowledge and intellectual capitals. These noteworthy capitals, regardless of whether they are from inside or outside or explicit or implicit, must be properly discovered, retained, upgraded, and given to the interested through using the newest technologies. It is obvious that gaining success in knowledge management plans is dependent upon collaborations between the various authorities of universities (Hazeri & Sarafzadeh, 2006).

2. Review of Literature

Notwithstanding the importance and necessity of knowledge management in the modern organizations, little studies have been done in the field of investigating the knowledge management infrastructures in the organizations especially in the universities.

In Malaysia, Abdullah *et al.* (2008) have done a research which is titled "An Empirical Study of Knowledge Management System Implementation in Public Higher Learning Institution". This study is a survey which has been done through distributing questionnaires in six state universities of Klang Valley. The findings have indicated that knowledge management has been executed in state institutes of higher education in Malaysia, although the culture of sharing knowledge is not still well institutionalized. Organizational structure of state institutes of higher education in Klang Valley of Malaysia is not yet appropriate to apply the knowledge management plan. But the results of institutes' readiness in the field of information technology for the application of knowledge management show the institutes' possession of this infrastructure

In another research, which is entitled "The Application of Knowledge Management in Enhancing the Performance of Malaysian Universities", Mohayidin *et al.* (2007) have investigated the effect of applying knowledge management in increasing Malaysia universities efficiency, and they have also studied the effects of other elements on achieving the knowledge management objectives. So, they have done a survey research in eight state and private universities of Malaysia. The findings have indicated that the effective factors in establishing the rudimentary innovations of knowledge management are as follows: infrastructural support, information culture, assembling, producing, retaining and disseminating of knowledge. Information culture has been averred as the most important factor. The results have shown that making changes in culture and human characteristics is seriously difficult, but if it can be feasible, very conspicuous effects can be achieved to succeed in the knowledge management projects.

Rowley (2000) has done a research titled "Is Higher Education Ready for Knowledge Management?" and studied the capability of applying knowledge management concepts in Canadian universities. In his study, He has stated that there are some adversities in making knowledge-based environment in the universities. He also proved that executing knowledge management system in Canadian universities is required to ameliorate organizational structures and rewarding system. Against two foregoing infrastructures, he regards information technology as the more necessary and appropriate factor to facilitate the activities of sharing knowledge.

Fathollahi *et al.* (2010) have accomplished a survey research entitled "Is the University of Isfahan Ready for Implementing Knowledge Management?" in which they have come to the conclusion that Isfahan University is ready from the dimension of culture for implementing knowledge management plan, but this readiness cannot be seen in other elements of 'structure and processes' and 'information technology infrastructure'.

In another research which is titled "Looking upon the infrastructure of knowledge management in Educational and Psychology Faculty of Isfahan University and presenting solutions to improve it" and has been done by Hoseyni (2007) in a university environment, after studying three fundamental factors of knowledge management infrastructures (managerial factor, organizational culture and technical elements), the researcher has come to the conclusion that technical infrastructure is in a suitable status throughout the university, but two other ones- managerial factor and organizational culture- do not have apposite conditions.

The present study intends to investigate three mentioned factors' status quo which are "human culture and elements, structure and processes, information technology infrastructure" and have been brought up in most of the implementation models of knowledge management as the main efficacious factors of the plan. Every element's readiness for implementing the knowledge management system has been assessed before executing the plan. The

findings of this research can provide an opportunity for the university to make some resolutions and programs for amending and organizing these infrastructures to avert possible damages resulting from plan's failure due to existing deficiency in any of these elements.

3. Research Questions

The main question which has been discussed in the research is whether Payame Noor University of Mashhad of Mashhad is ready to implement the knowledge management system or not. This question has been asked in the form of three minor questions which are as follows:

1- Is the element of 'culture and human factors' in an appropriate status at Payame Noor University of Mashhad of Mashhad to implement the knowledge management system?
2- Is the element of 'structure and processes' in an appropriate status at Payame Noor University of Mashhad of Mashhad to implement the knowledge management system?
3- Is the element of 'information technology' in an appropriate status at Payame Noor University of Mashhad of Mashhad to implement the knowledge management system?

Owing to the fact that the faculty members' specialization and scientific grade can affect their perspectives on the matter of knowledge management infrastructures' status, two other minor questions have been proposed as following:

4- Is there any significant difference between the faculty members' viewpoints of Payame Noor University of Mashhad in the fields of humanities, engineering, basic sciences and medical sciences about the university's readiness for the implementation of knowledge management system?
5- Is there any significant difference between the faculty members' viewpoints of Payame Noor University of Mashhad in various scientific grades (professor, associate professor, assistant professor and instructor)?

4. Research Method

The present research is applied and the method which has been chosen, considering the research nature and objectives, is descriptive-survey.

Data has been assembled through a reviewed questionnaire which is originally designed by Hurbert Rampersad (2002) for different kinds of organizations. The questionnaire is consisting of two parts. Demographic questions have been asked in the first part which includes age, marital status, gender, degree, scientific grade and department. Second part of the questionnaire is consisting of 50 questions (in buoy form) in different fields of "culture and human factors" (25 questions), "structure and processes" (15 questions) and "information technology" (10 questions). A rudimentary sample has been used to appraise the reliability of the research. This rudimentary questionnaire has been distributed between 20 people and its validity, which has been calculated by SPSS software and Cronbach's Alpha formula, is 0.94 that indicates the high validity of the questionnaire. Due to the fact that the questionnaire consists of three parts, Alpha's coefficient has been considered for all three different parts. Alpha's coefficient of "culture and human factors" is 0.94, "structure and processes" is 0.92 and "information technology infrastructure" is 0.84. Statistical universe of the research is consisting of the whole faculty members of Payame Noor University of Mashhad which are 52 people. Considering the limited number of research's statistical universe, the whole faculty members have been regarded as the samples. The following table shows the statistical sample's features:

Table 1: The respondents' characteristics

Respondents' characteristics	Scientific Grade				Marital status		Gender		Degree		Department		
	Prof.	Assoc. Prof.	Assistant Prof.	Instructor	S.	M.	F.	M.	MA.	PhD.	Hum.	Sci.	Eng.
Frequency	4	7	29	12	9	43	19	33	16	36	18	12	22
Percent	7.7	13.5	55.8	23	17.3	82.7	36.5	63.5	30.8	69.2	34.6	23.1	42.3

5. Research Results

The first sub-question: Is the element of 'culture and human factors' in an appropriate status at Payame Noor University of Mashhad to implement the knowledge management system?

T test has been used to answer this question conforming to table 2.

Table 2. T test premises apropos of the first minor question of the research

Element	Sample Size	Mean of Degrees	Mean of comments	SD	SE	T-value	P-value
culture and organizational factors	52	3	2.47	0.73	0.102	-5.57	0.000

The results of table 2 in which calculated T-value (-5.57) is more than t of the table (2.015) indicates that calculated t-value is at the confidence level of 95%. But, considering the fact the mean of comments (2.47) is less than average level; therefore, Payame Noor University of Mashhad is not at the average level of readiness to implement the knowledge management plan in the dimension of 'culture and human factors'.

The second sub-question: Is the element of 'structure and processes' in an appropriate status at Payame Noor University of Mashhad to implement the knowledge management system?

T test has been used to answer this question matching with table 3.

Table 3. T test premises apropos of the second minor question of the research

Element	Sample Size	Mean of Degrees	Mean of comments	SD	SE	T-value	P-value
Structure and processes	52	3	2.17	0.93	0.129	-6.363	0.000

The findings of table 3 shows that the absolute calculated T-value (- 6.363) is more than t of the table (2.015) and its confidence level is 95%. But regarding the issue that mean of comments (2.17) is less than average level, so Payame Noor University of Mashhad is not at the average level of readiness to implement the knowledge management system in the dimension of 'structure and processes'.

The third sub-question: Is the element of 'information technology' in an appropriate status at Payame Noor University of Mashhad to implement the knowledge management system?

Table 4. T test premises apropos of the third minor question of the research

Element	Sample Size	Mean of Degrees	Mean of comments	SD	SE	T-value	P-value
Information technology infrastructure	52	3	2.51	0.78	0.108	-4.470	0.000

Results of table 4 indicate that the absolute calculated T-value (- 4.470) is more than t of the table (2.015). It is at the confidence level of 95% and considering the fact that mean of comments (2.15) is less than average level; therefore, Payame Noor University of Mashhad is not at the average level of readiness to implement the knowledge management system in the dimension of 'information technology infrastructure'.

The forth sub-question: Is there any significant difference between the faculty members' viewpoints of Payame Noor University of Mashhad in the fields of humanities, engineering and basic sciences about the university's readiness for the implementation of knowledge management system?

Variance analysis test (F-test) has been applied to answer this question, according to table 5.

The results of table 5 indicates that the amounts of different elements (F) such as 'culture and organizational factors', 'structure and processes' and 'information technology infrastructure' is less than 0.05 which is not significant; therefore, from the above dimensions, there is no significant difference between the viewpoints of faculty members of various departments.

Table 5. The comparison of average number of elements' readiness of Payame Noor University of Mashhad from the viewpoint of faculty members of different departments

Elements' statistical indices	Humanities		Engineering		Basic sciences		Variance analysis (F)	Significance level (P)
	Mean	Variance	Mean	Variance	Mean	Variance		
Culture and human factors	2.34	0.65	2.61	0.79	2.52	0.78	0.559	0.575
Structure and processes	1.92	0.69	3.21	1.07	2.18	1.00	1.602	0.212
Information technology infrastructure	2.37	0.82	2.79	0.71	2.49	0.78	1.094	0.343

The fifth sub-question: Is there any significant difference between the faculty members' viewpoints of Payame Noor University of Mashhad in various scientific positions (professor, associate professor, assistant professor and instructor)?

Variance analysis test (F-test) has been applied to answer this question, according to table 6.

Table 6. The comparison of average number of elements' readiness of Payame Noor University of Mashhad from the viewpoint of faculty members of different scientific positions

Elements	Professor		Associate Prof.		Assistant Prof.		Instructor		(F)	(P)
	Mean	Variance	Mean	Variance	Mean	Variance	Mean	Variance		
Culture and human factors	3.16	0.31	3.18	0.71	3.39	0.78	3.62	0.52	2.061	0.118
Structure and processes	3.60	1.22	3.14	0.66	3.32	0.90	3.65	0.64	1.157	0.336
Information technology infrastructure	3.67	1.15	2.86	0.85	3.21	0.83	3.44	0.70	0.61	0.611

The results of above table indicates that the amounts of different elements (f) such as 'culture and organizational factors', 'structure and processes' and 'information technology infrastructure' is less than 0.05 which is not significant; therefore, from the above dimensions, there is no significant difference between the viewpoints of faculty members of various scientific positions.

The main question: Is Payame Noor University of Mashhad ready to implement the knowledge management system?

The results of table 7 show that the absolute calculated T-value (-6.034) is more than t of the table (2.015) and its confidence level is 95%. Considering the fact that mean of comments (2.39) is less than average level, so the readiness of Payame Noor University of Mashhad to implement the knowledge management system is not at the average level in different dimensions of 'culture and human factors', 'structure and processes' and 'information technology infrastructure'.

Table 7. T test premises of the main question of the research

Element	Sample Size	Mean of Degrees	Mean of comments	SD	SE	T-value	P-value
Knowledge management	52	3	2.39	0.72	0.10	-6.034	0.000

Freidman test has been applied to rank the fundamental infrastructures of knowledge management system in Payame Noor University of Mashhad and its results can be seen in table 8. As it is indicated in table 8, there is a significant difference between the indexes since p-value is less than 0.05, so the differences are not accidental. The most important and effective index is "culture and human factors" and least one is "structure and organizational processes".

Table 8. Ranking the elements on the basis of Freidman test

Freidman Test		Element	Mean of ranks
Total Number	52	Culture and human factors	2.21
Chi square test	13.174	Structure and processes	1.60
Degree of freedom	2	Information technology infrastructure	2.19
P-value of the test	0.01		

6. Results

Considering the achieved findings of the present study and comparing them with the effective elements in implementing knowledge management system which have been mentioned in the foregoing studies at review of literature section and can be ascertained in table 9, we can come to a conclusion in accordance with the findings of this study.

Table 9. The comparison of effective elements in implementing knowledge management system between different universities throughout the world

University	Effective elements in implementing knowledge management system		
Payame Noor University of Mashhad	Culture and human factors	Structure and processes	Technical infrastructures
Isfahan University	Culture and human factors	Structure and processes	Information technology
Educational faculty of Isfahan University	Information technology	Technical factors	Information systems
Case study (Canadian Universities)	Organizational culture	Disseminating knowledge systems	Information systems
Case study (state Universities of Malaysia)	Human capitals	Informing	Technology
Case study (Malaysia Universities)	Information culture	Human factors	Technical infrastructures

As it can be noticed, the mentioned prerequisites in the above table, which are effective in implementing knowledge management system, are mostly in common with each other.

Regarding the accomplished researches in the field of knowledge management, "culture and human factors" is the most principal challenge which knowledge management system faces. Culture is the most challenging element which affects knowledge management in the universities too. The findings of this research indicate that "culture and human factors" is the most considerable infrastructure of knowledge management. Additionally, the data analysis shows that this dimension is not at the average level of readiness in Payame Noor University of Mashhad to implement knowledge management. The research results about the amount of readiness in the dimension of "culture and human factors" to implement knowledge management at Payame Noor University of Mashhad are analogous with the findings of most of the researches except those which have been done by Fathollahi et al. (2010). The examples which can be adverted are as follows: Hoseyni (2007), Rowley (2000), Abdullah et al. (2008) and Mohayidin et al. (2007).

In the second question of the research, another significant element in implementing knowledge management which is "structure and processes" has been investigated. The findings of the research indicate that this element is the least important one at Payame Noor University of Mashhad. The readiness of this dimension for executing knowledge management system is less than the average and inappropriate level. The achieved results of following studies have been in the direction of the findings of the present study: Rowley (2000), Abdullah *et al.* (2008), Fathollahi *et al.* (2010) and Hoseyni (2007).

The last question of the research has been devoted to another noteworthy element in implementing knowledge management which is "information technology infrastructure". The statistical analysis shows that the element of "information technology infrastructure" is not still at the average level of readiness to execute knowledge management but it is in a better status than two other infrastructures of "culture and human factors" and "structure and processes" at Payame Noor University of Mashhad. Paying heed to other infrastructures, besides the information technology infrastructure, is of considerable importance due to the fact that the only element of information technology infrastructure cannot exclusively make success for the knowledge management system. It is probable for the knowledge management system to end in failure in spite of possessing a proper information technology infrastructure, just because of inappropriate culture to share knowledge or limiting rules and structures to improve and disseminate knowledge or even inability of people to encounter and use the equipment and facilities of information technology and knowledge management system. The findings of this part of the research are akin to the results of done researches by Fathollahi et al. (2010) which shows that information technology infrastructure is not in an acceptable status at Isfahan University, while other researches which have been accomplished by Hoseyni (2007), Rowley (2000) and Abdullah et al. (2008) are an indication of suitable information technology infrastructure to implement knowledge management system in the organizations in which they had studied.

7. Recommendations

Considering the studied significant infrastructures and owing to the fact that suggestions should be in accordance with the findings of the research, the following suggestions has been proposed to achieve the suitable level of readiness to implement knowledge management system. It is worthy of attention that the suggestions are the results of a research project and we hope that they can be useful for the interested people, researchers, professors and programmers at the universities especially Payame Noor University as the biggest state university of Iran.

Institutionalizing of culture

Organizational culture has been known as pivotal element in most of the researches which has been accomplished apropos of knowledge management. A proper organizational culture can bring about ample individual and organizational opportunities. The universities' presidents should make the culture of sharing knowledge and team works to facilitate the implementation of knowledge management system.

Amelioration of the appraisal criteria of performances and optimization of salaries and rewards system

Regarding the great importance of knowledge, managers should consider this factor in their appraisal of the individuals' performance. The staffs of the organizations should be aware of the fact that their performance has to be in the direction of improving the processes of engendering, transferring and applying knowledge. The universities must amend their system of giving salary and rewarding to the staffs under a new knowledge-based system of assessment.

Paying heed to information technology

Information technology is one of the significant infrastructural factors which help to the knowledge management success. The universities' presidents should provide the required programs to obviate the need of education with regard to effective usage of information technology equipment and actuate the researchers to apply this technology in the activities of sharing knowledge.

Advocate of universities presidents

It is approved by the experts that presidents' advocacy of knowledge management is an important element of its success. If they do not support, no activity can get started and even if it gets started, it will never prove a success. The presidents' support of knowledge management can be appeared in different forms such as: employing the knowledge-based prospects, objectives and resolutions for the university, employments, holding training courses of knowledge management and amending the system of giving salary and rewarding in the direction of knowledge management system

The necessity of employing knowledge managers

Employing knowledge managers in the universities (it should be adverted that such an organizational post does not exist in the university at the present time) is of considerable importance and facilitates and accelerates the process of sharing knowledge. Knowledge manager should put emphasis on the assembling knowledge and delivering it in an organized way. This knowledge can be retained and used through computers at the libraries.

Amending the organizational structure and chart

The university should simplify the organizational structure and chart to facilitate the process of sharing knowledge and communications. People should communicate with each other through the least number of go-betweens and be able to gain advantage from each other's knowledge at a minimum time. In this direction, reviewing and ameliorating the limiting rules and procedures are effective in improving people's communications at the university, sharing knowledge and discovering the knowledgeable people.

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