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Full Length Research Paper

An assessment of Knowledge Management (KM): A consideration of information, culture, skills and technology

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The impact of knowledge management on organizational performance has been a popular research topic in recent years. However, it seems to be a lack of empirical studies that measure knowledge orientation in educational environments, even though knowledge orientation and universities are considered complementary organizational approaches. This paper explores the level of knowledge management based on four pillars: information, culture, skills and technology. The methodology involved both qualitative and quantitative research to assess and evaluate knowledge management based on literature in the university. Data from 124 participants were analyzed. The instrument used was a standardized research questionnaire on knowledge management, the internal correlation of which was calculated through Cronbach's alpha of 91%, and then analyzed through SPSS. In general, the findings indicated that there were some tokens of knowledge management that were ranked above the average level (culture, skills and technology); but that information was lower than average. The concrete tokens for knowledge management were developing at an increasing pace. Moreover, the results showed that there was a significant difference in the perception and experience of knowledge management in the university between two groups (lecturers and staff). Furthermore, there was some evidence, to imply a trend of knowledge management development. A ranking of existing and desired conditions was presented. The paper provides empirical data on knowledge orientation in a university environment, and contributes to the research on the impact of knowledge management on organizational performance.

Key words: Knowledge management, culture, skills, information, technology, university.

INTRODUCTION

The competitive conditions in organizations today have become more widespread and varied than they were in the past. This context is changing so rapidly that for the majority of organizations the pace is far too rapid for them to be able to respond to and keep up with. In other words, as soon as there is a change in competitive conditions to which the organization attempts to react and adapt, the next change takes place and the organization needs to adjust itself to the new conditions in order to maintain its position and survive.

Hence, an organization is more successful if its employees work together in a safe space and culture. An organization that is unable to continuously develop, share, mobilize, cultivate, put into practice, review and spread knowledge will be unable to compete effectively (Rampersad, 2002). This is the reason why the ability of an organization to improve existing skills requires new technology, information and experience in organizational culture.

Universities are no exception. Since they are centers for the production and distribution of knowledge, they

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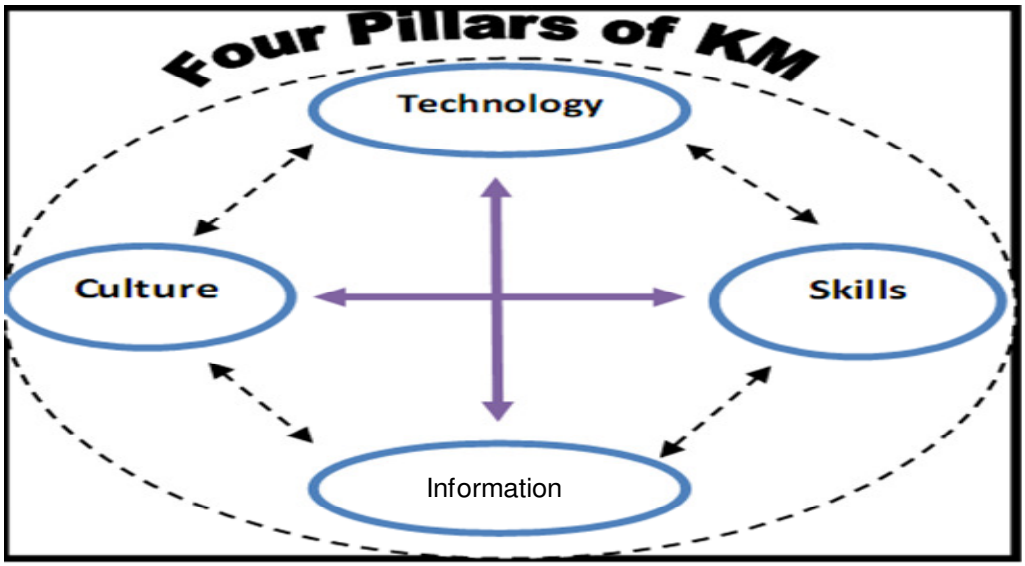

Figure 1. KM based on four pillars.

need to have sufficient potential for both greater dynamism and stability. Later, establishment of innovation and consequently creating new knowledge have been regarded as important achievements for academic institutions, and such institutions have mainly focused their attempts on promoting knowledge and enriching intellectual capital through the implementation of their existing resources. These resources include not only information but also all the intellectual capital as well as culture, skills, technology and human resources, all of which need to be identified and used systematically through proper management methods. The emergence of knowledge management (KM) from the management of information is indicative of attempts in the field to bring together internal intellectual capital and the resources produced internally with external resources, and to spread the institutions' activities beyond issues of education and research, to encompass official procedures of executive processes. In order to achieve this goal, Islamic Azad University of Firouzabad, as a centre for the creation and distribution of knowledge, like any other organization, requires KM to be implemented to handle the potentialities and commitments of skilled employees by identifying methods for creating, recognizing, implementing and distributing organizational knowledge. Thus, at the organizational level, KM emphasizes the creation, utilization and development of an organization's collective intelligence (Loh et al., 2003). Therefore, in order for knowledge to be enhanced effectively, interaction is necessary between technologies, techniques and people to allow an organization to manage its knowledge effectively (Bhatt, 2001). Hence, the relationship between culture, information, technology and skills must be considered.

In order to measure this ability, this article introduces a knowledge management based on culture, skills, information and technology, and in this research, an attempt is made to identify the level of KM based on four pillars (culture, skills, information and technology). The research consisted of both qualitative and quantitative methods.

Moreover, the following questions are addressed in this research in relation to the literature:

1. What is the contribution of the literature to the field of KM assessment in organizations?
2. Is there any evidence for KM within universities?
3. What are the employees' perspectives toward KM?
4. What is the relative importance of the four pillars (culture, skills, information and technology) in the "existing condition" and "desired condition"?

KNOWLEDGE MANAGEMENT AND THE FOUR PILLARS (CULTURE, SKILLS, INFORMATION, TECHNOLOGY)

Knowledge is a function of culture, skills, information (Rampersad, 2002) and technology. Culture is the totality of standards, values, views, principles and attitudes of individuals within a particular context that underscore their behaviour and functioning. Skills refer to people's capabilities, abilities and personal experiences; it relates to what people can do, what they know and what they understand. Information comprises the definition given to data or information obtained according to certain conventions. Technology is a tool, instrument and resource for the creation, utilization and transformation of

knowledge (Rampersad, 2002). (Figure 1).

Culture is the totality of standards, principles, values, views, perspectives and attitudes of individuals that determine their reactions and performance. The conversion processes is triggered spirally, and is therefore called the “knowledge spiral”; knowledge creation and sharing become part of the culture of an organization (Yang and Wu, 2008). The political and cultural environments are known from the analysis of knowledge culture because effective knowledge management cannot take place without extensive behavioral, cultural and organizational change (Davenport and Prusak, 2000). Imani and Mackenzie (2004) argue that the relationship between culture and knowledge management is much more complex; their findings suggest that culture not only creates in advance a context for knowledge sharing, but from a conceptual standpoint extends to encompass social tacit knowledge, and that knowledge sharing and tacit knowledge are inextricably linked.

Skills refer to individuals’ aptitudes, talents, capacities, capabilities, abilities and personal experience; it relates to how people can make a connection between understanding, knowing and doing. The results of a study show that the firms in the sample recognize the need for multi-skilled personnel to exploit the advantages stemming from the adoption of information and communication technology (ICT) (Spanos et al., 2002). The ability of a university to improve existing skills and acquire new ones is its strongest competitive advantage, and as a result technology is enabling individual “expert” knowledge to be transformed into knowledge that is widely attainable.

Information is considered as an organized set of data, and knowledge is perceived as meaningful information (Bhatt, 2001). Information includes the meaning given to data or information acquired. Many organizations are developing information systems designed particularly to facilitate the sharing and integration of knowledge (Alvani and Leinder, 2001). The activities involved in the process are analyzed to provide supplementary information and to enable the identification of the types of knowledge needed for proper implementation (Castellanos et al., 2004).

Instead of focusing on transaction costs in the markets for knowledge, organizations need to develop internal capabilities to enable them to leverage technological knowledge externally (Lichtenthaler, 2008). The process of creating, acquiring and utilizing knowledge is held to improve organizational performance (Laudon and Laudon, 2005). In order to achieve the desired outcome, organizations must not only build appropriate ICT infrastructures but must also integrate human resources, computer systems, network technologies and other corresponding organizational arrangements to effectively obtain, store and utilize knowledge (Jafari et al., 2009). Tseng (2008) divides knowledge networks into five sub-technological fields: electrical engineering, audiovisual technology, telecommunications, computer technology and the semiconductor field. Document and KM technologies merely repackage that information for easier use (Schultze and Boland, 2000).

A common element in many KM research frameworks is organizational culture. For the most part it is assumed that technology plays a key role in the processes involved in KM. A broader view examines KM requirements from three perspectives: (a) information-based; (b) technology-based; and (c) culture-based (Alavi and Leidner, 2001; Karlsen and Gottschalk, 2004), skills and information.

The last of these viewpoints highlights the importance of organizational culture in the KM process. Complications at the organizational level have been described, including culture, power (Hall and Goody, 2007) and technology (Fernandez and Sabherwal, 2004). Not all KM processes require high levels of investment in technology. More importantly, the successful use of the technology is often dependent on the incorporation of KM behaviour into the organizational culture. Employing more technology has the potential to further free individuals from commodity work by increasing their efficiency and therefore allowing them to engage in value-adding activities. However, such an implementation of technology would require a different kind of analysis of system requirements, one that examined not only what the analysts do, but also what they should be doing. In order to reduce the technology knowledge gap, deliberate measures will be required to build scientific and technological capacities of universities.

A REVIEW OF KNOWLEDGE MANAGEMENT

In recent years, various researchers have discussed different aspects of KM, which can be classified in several categories. So, distribution, application areas and the resources is presented in Table 1. In addition, on the basis of a review of more than 100 papers of KM performance evaluation, the classifications shown in Table 2 can also be used.

Assessing knowledge management in universities

With regard to knowledge management in universities, Sarkar Arani (2005) has focused on the challenges in Japan and the prerequisites for internationalization of knowledge management in universities, as well as universities’ duties to produce knowledge and KM. On the basis of his conclusion he stated that in a world in which the strong boundaries of the past are collapsed by information technology and communication, and the stability of past findings is reduced, educational institutions, including universities and their curriculums, should be reconstructed so that mutual understanding is possible through an expansion of international cooperation.

This dynamic recognition and cooperation helps us to

Table 1. General classification of knowledge management.

Perspective category	Resources	Total
Organizational knowledge	Argyris, 1990; Sommerville and Dalziel, 1998; Goffee and Jones, 2001; Rampersad, 2001; Hall and Andriani, 2002; Hwang, 2003; Albers and Brewer, 2003; Kakabadse et al., 2003; Bose, 2004; Vlok, 2004; Goh, 2004; Abdullah et al., 2005; Wu and Wang, 2006; Montequín et al., 2006; Fernandez et al., 2006; Gillingham and Roberts, 2006; Golban and Kianzade, 2006; Shen et al., 2007; Gumus, 2007; Tseng, 2008; Kayakutlu and Buyukozkan, 2008; Chang and Wang, 2009; Chen and Lin, 2009; Wen, 2009.	24
Theoretical and fundamental concepts of knowledge management	Barney, 1991, 1996; Von Krogh and Roos, 1995; Wernerfelt, 1984, 1995; Teece, 1998, 2000; Wheelwright and Clark, 1992; Argyris, 1990; Sveiby, 2001; Schultze and Leidner, 2002; Hall and Andriani, 2002; Rodrigues and Martis, 2004; Wong and Aspinwall, 2004, 2006; Papoutsakis and Vallès, 2006; Park, 2006; Gillingham and Roberts, 2006; Lin, 2007; Thitithananon and Klaewthanong, 2007; Alrawi, 2007; Tseng, 2008; Wu et al., 2008; McFarlane, 2008; Chen and Lin, 2009.	25
Categories of knowledge management	Drucker, 1990, 1991; Grant, 2000; Nonaka and Takeuchi, 1995; Sveiby, 1992, 1997; Von Krogh et al., 1998, 2000a, 2000b; Applegate et al., 1999; Bontis, 1999; Alavi and Leidner, 2001; Kakabadse et al., 2003; McNurlin and Sprauge, 2004; Jafari et al., 2005; Khadivar et al., 2005; Lee et al., 2005; Gillingham and Roberts, 2006; Montequín et al., 2006; Papoutsakis and Vallès, 2006.	20
Relationship between knowledge management and IT	Quinn, 1992; Drucker, 1993; Nonaka and Takeuchi, 1995; Prusak, 1997; Davenport and Prusak, 2000; Bhatt, 2001; Schultze and Leidner, 2002; Hijazi and Kelly, 2003; Wu and Wang, 2006; Papoutsakis and Vallès, 2006; Rodrigues et al., 2006; Alhawary and Alnajjar, 2008.	12

develop a better and more realistic picture of our history; to reach a higher level of self-awareness and self-consciousness; and to prepare sufficiently for international understanding and cooperation, especially in national, regional and global issues. It also enables more higher education institutes to participate in the field of the production of science (Sarkar Arani, 2005). In the assessment of KM in universities within this framework, there is a question cited:

How well does the model of KM systems in universities reflect the success indexes and theoretical foundations of the general model of KM systems?

Basically, this approach can be employed for implementing and developing KM systems, with a recommendation that theories should be investigated through identifying the manner in which the observed data are reflected. Jamshidi and Nemati (2008) examined knowledge sharing and experience of social capital development within IT units in a university. They showed that there was a significant difference between the knowledge-sharing process and the social capital experience.

Specific research questions

The research questions of the study were as follows:

1. At what level is KM at Firoozabad Islamic Azad University?
2. What is the priority of the four pillars (culture, skills, information and technology) in the “existing condition” and “desired condition”?
3. How can KM be put into practice in universities, and how can strategies be provided for enhancing the effectiveness of KM at Firoozabad Islamic Azad University?

METHODOLOGY OF THE STUDY

The present study involved a survey of all faculty members and staff at Firoozabad Islamic Azad University. The population of the study was selected through stratified sampling. The data obtained from the 124 participants in the sample (more than 40% of the population) were analyzed. Descriptive statistical methods such as percentage, mean and standard deviation were used. Depending on the type of variable, the t-test and correlation coefficients were applied in order to investigate the correlation.

Participants

Questionnaires were sent to participants (staff and lecturer) with significant responsibility in order to measure the level of KM: 140 faculty members and university staff were selected through stratified random sampling and investigated through standardized instruments for the management of knowledge designed by the researchers. The collected data was analyzed using SPSS.

Of the 140 questionnaires distributed, 131 were completed by employees, resulting in 124 usable responses (58 staff and 66 lecturers). There were 76 male and 48 female respondents. Their ages were as follows:

23% were younger than 30 years; 51% were aged 30 to 40 years;

Table 2. KM categories based on specific aspect.

Perspective	Classifications/categories	Author(s)
Method-based	Marketing cost methods, return on assets, direct intellectual capital, score card	Bontis, 1999
Major-focus-based	Benchmarking focus, performance measurement focus, Skandia Business Navigator, value focus	Liebowitz et al., 2000
Knowledge steps	Knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application activities, knowledge capitalization, knowledge balancing	Bhatt, 2001
Indicator-based	General management, leadership style, strategic vision, internal process, human resources	Rampersad, 2002
Method-based	The balanced score card, economic value-added, Skandia Business Navigator	Bose, 2004
Area-based	Background/structural factors, knowledge production, knowledge integration	Vlok, 2004
Area-based	Knowledge measurement in products and processes, measurement of knowledge value in internal organization, measurement of organizational conditions based on KM processes	Khadivar et al., 2005
Method-based	Direct intellectual capital, score card, marketing cost methods, return on assets	Jafari et al., 2005
Indicator-based	Context indicator, input indicator, process indicator, output indicator	Natakuatoog, 2005
Knowledge applied	Knowledge creation, knowledge accumulation, knowledge sharing, knowledge utilization, knowledge internalization	Leea et al., 2005
KM – aspects	Psychological, culture, process, functionality, architecture	Abdullah et al., 2005
KM – aspects	Technology, process, people	Montequín et al., 2006
Model-based	Cognitive model, network model, community model, quantum model, philosophy-based model, general intellectual capital (IC) measurement model	Kakabadse et al., 2003; & Montequín et al., 2006
Indicator-based	Knowledge or information quality, perceived knowledge management system (KMS) benefits, user satisfaction, and system use were used as dependent variables in evaluating KMS success	Wu and Wang, 2006
Indicator-based	KM process (knowledge acquisition, knowledge conversion, knowledge application and knowledge protection), KM effectiveness (individual-level and organizational-level KM effectiveness) and socio-technical support (organizational support and information technology diffusion) based on the previous literature	Lin, 2007
KM – aspects	People, structures and processes	McFarlane, 2008
Analysis-based	Qualitative analysis, quantitative analysis, non-financial indicator analysis, financial indicator analysis, internal performance analysis, external performance analysis, project-orientated analysis, organization-orientated analysis	Chen and Lin, 2009
Different aspects	Employee traits, strategy factors, superintendent traits, audit and assessment, organizational culture, operating procedures, information technology	Chang and Wang, 2009

and 26% were over 40 years. Meanwhile, 78% were married and 22% were single.

In terms of education levels, 11 people had less than a Bachelor's degree; 47 held a Bachelor's degree; 30 had a Master's degree; and 36 had a PhD (doctorate).

With regard to work experience, 34 respondents had 1 to 5 years; 43 had 6 to 10 years; and 47 had more than 10 years (Table 3).

Thus, the following groups contained the largest number of respondents:

1. Position: lecturer.
2. Gender: male.
3. Marital status: married.
4. Age group: 30 to 40 years.
5. Education level: Bachelor and PhD.
6. Experience: more than 10 years.

Sampling design

Four sets of measures were adopted and used to measure each of the four constructs, namely, culture, skills, information and technology. These measures were subjected to a formal pre-test by a number of managers and experts. Some minor modifications were carried out to clarify the meanings of some items. A variety of KM approaches and systems must be employed in organizations in order to deal effectively with the diversity of knowledge types and attributes (Alavi and Leidner, 2001). According to Alrawi (2007) there are many aspects of KM, and the way in which it is applied in organizations depends on the structure of the organization.

Table 3. Details of respondents' demographic.

Demographic Characteristics	Category Specification	Frequency	Percent	Cumulative
Job groups	Staff	58	46.8	46.8
	Lecturers	66	53.2	100.0
Gender	male	76	61.3	51.3
	female	48	38.7	100.0
marital	married	97	78.2	78.2
	single	27	21.8	100.0
Age	<30	28	22.6	22.6
	30-40	63	50.8	73.4
	>40	33	26.6	100.0
Education level	Under bachelor	11	8.1	8.1
	Bachelor degree	47	37.9	46
	master	30	24.2	70.2
	PhD	37	29.8	100.0
Years of experiences	1-5	34	27.4	27.4
	6-10	43	34.7	61.1
	>10	47	37.9	100.0

However, the structure, processes and procedures of KM have not yet been defined as a tangible standard, and it is difficult to find comprehensive and explicit reference criteria (Wen, 2009).

An internal consistency analysis was carried out separately for each variable in the theorized model by calculating Cronbach's alpha (the reliability coefficient). The results in Table 3 show that the Cronbach coefficient for all the variables in the model were above the critical value of 0.7 (Nunnally, 1978). Hence, the authors concluded that all the items had been appropriately assigned to each variable. The instrument developed also had content validity, since the selection of measurement items was based on an exhaustive review of the literature and a detailed evaluation by academics and practitioners. Content validity depends on how well the researchers have created the measurement items to cover the content domain of the variable being measured (Nunnally, 1978). The study used a five-point rating scale, that is, from 1 (strongly disagree) to 5 (strongly agree). The reliability alpha (α) of different variables and sample items for each variable are discussed.

FINDINGS / RESULTS OF THE STUDY

The correlation and validity of the instrument's statements were calculated using the Cronbach method.

The correlation for all the subscales of KM were high and significant at 0.01; the correlation for the skills indicator was ranked highest (r = 0.919), culture was ranked second (r = 0.876), technology was ranked third (r = 0.860) and information was ranked the lowest (r = 0.840) (Table 4).

The Cronbach's alpha value for culture was 0.82, and for skills 0.84. Among the indicators, information had the lowest value at 0.78 and technology was 0.86. Fortunately, the reliability coefficient for KM as a whole was very strongly (Table 4), an alpha value of 0.91 indicating that the research instrument has high validity. Moreover, the minimum alpha value for subscales was 0.78, which is a rather high value.

Description of data

Normal distribution

Table 5 shows the mean, standard deviation, skewness and kurtosis for four indicators (culture, skills, information and technology) and the total for KM. The normality of the distribution of variables was assessed based on kurtosis and skewness, with the resulting exploratory analysis showing a strong degree of normality for the KM scale.

Means of different variables

The mean values of the different variables are presented in Table 5. These are mean values on a five-point scale (1 = strongly disagree; to 5 = strongly agree) of the four indicators within KM. The average scores of the indicators were moderate, with the exception of

Table 4. Output of statistical information.

Indicator	No	Cronbach's alpha	Mean	Correlations	Sig.
Culture	8	0.82	24.8	0.876**	0.000
Skills	12	0.84	37.9	0.919**	0.000
Information	9	0.78	25.9	0.840**	0.000
Technology	10	0.86	31.46	0.860**	0.000
KM – Total	39	0.91	120		

Table 5. Output of descriptive statistics.

Indicators	Total No	No	Mean	SD	Skewness	Kurtosis
Culture	124	8	24.8	0.40804	-0.213	-0.299
Skills	124	12	37.9	0.6753	-0.766	-0.067
Information	124	9	25.9	0.43446	-0.286	-0.597
Technology	124	10	31.46	0.50998	-0.588	-0.206
KM – Total	124	39	120	1.77	0.796	0.149

information, which was lower than average, indicating that the respondents believed that the level of KM in relation to these criteria was less than average. In fact, the employees did not express positive opinions on the following:

1. Integrating management information systems.
2. Knowledge networks.
3. Knowledge transaction.
4. Knowledge documented.
5. Up-to-date knowledge.
6. Knowledge transformation.

It appears that information is more challengeable and tangible than the other indicators, so is more apparent to employees. Moreover, the indicators for leadership and process skills, technology learning and utilization commitment of others scored lower than average, while discussing openly, problem solving, purchasing modern technology, technical skills and culture-making commitment had maximum scores.

Indicators of KM: Data analysis

The main objective of this research was to identify and investigate the pattern for establishing KM in a university. In the other words, this research sought to answer the questions of whether there are any signs or evidence in a university for knowledge-based management, and of how this new and efficient pattern can be implemented or strengthened in a university. The minor objectives of the study included studying the demographic features such as gender, age, educational attainment level and the types of respondents in the study (faculty members and staff); studying the parameters of knowledge-based management, such as the general style of management, leadership style, strategic vision and internal management processes within a university; and investigating the status of human resources in a university. According to Table 6, the mean values for the two groups (staff and lecturers) vary. This indicates that there is a significant difference between the approach of staff and lecturers in relation to culture, skills, information and technology. In addition, the ranges of standard deviations in the measures differ between the two groups. It appears that the lecturers were more focused in their approach. Thus, the lecturers' assessments were more positive because they have more information and a deeper and wider vision.

It is obvious that the statements of measures needed to encompass a wider vision of KM, since following the promotion of facilities by the university to achieve KM, lecturers appeared to be more satisfied with the situation. The results of participants' rankings of the parameters are shown in Table 7.

Also, the results of an essay-type question on the desired condition of KM based on four pillars (culture, skills, information and technology) are showed in Tables 8 and 9.

Also as shown a comparative scoring in Table.10; priority of existing and desired conditions respect of staff (approximately) is vice versa. It means staff expectances and requests' is contrary with there is existed. But respects of lecturer priority of existing and desired conditions (approximately) are the same. Meanwhile, totally (respect of all employees) is moderate.

DISCUSSION ON THE FINDINGS

According to Wong and Aspinwall (2004, 2006), KM is an

Table 6. Output of group statistics.

Items	Position	N	Mean	SD
Culture	Staff	58	23.9138	5.84683
	Lecturer	66	25.5909	2.78445
Skills	Staff	58	35.241	9.5409
	Lecturer	66	40.277	3.7018
Information	Staff	58	23.1552	5.14970
	Lecturer	66	28.3182	2.89381
Technology	Staff	58	29.1897	6.59467
	Lecturer	66	33.4545	3.77515
KM – Total	Staff	58	111.5000	24.73243
	Lecturer	66	127.6212	8.95762

Table 7. Rankings of the existing condition of KM.

Index	staff	lecturers	all
Culture	1	3	3
Skills	2	1	1
Information	4	4	4
Technology	3	2	2

Table 8. Output of scores allocated to desired condition of KM.

Indicator	Staff		Lecturer		Total	
	score	%	score	%	score	%
Culture	105	0.18	104	0.16	209	0.17
Skills	139	0.24	230	0.35	369	0.30
Information	167	0.29	160	0.24	342	0.27
Technology	169	0.29	166	0.25	320	0.26
Total	580	1	660	1	1240	1

important strategy for improving organizational competitiveness and performance; how knowledge-based organizations can be evaluated has become one of the most important issues in KM (Wu and Wang, 2008).

When managers have greater recognition of KM, they have better understanding of the issues and realize its importance. Meanwhile, Chen and Lin (2009) have described the benefits that the KM project can bring to companies, and expressed the urgency of taking the initiative. According to Kidwell et al. (2001), KM should not be seen as an extreme change: the concern should be to focus on a thorough implementation of KM.

According to the results described above, one of main problems for the university is the lack of or weak procedures and suitable organizational structures. The results of another study (Wen, 2009) named “procedures, people, supporting organizational structure and information technology” as the four key ingredients of success for KM.

Furthermore, in rankings reported by Wen (2009), the priorities of a number of criteria were identified: information, staff, wisdom, knowledge and data. Meanwhile, in the current research the lowest score was given to information (data collection, sharing and transfer is lower than the mean). Moreover, research by Alhawary and Alnajjar (2008) showed that the information systems technology had a significant impact on knowledge creation and conversion.

Table 9. Rankings of the desired condition of KM.

Index	Staff	Lecturers	All
Culture	4	4	4
Skills	3	1	1
Information	2	3	2
Technology	1	2	3

Table 10. A comparative ranking of the existing and desired condition.

Index	Staff		Lecturers		All employees	
	Existing	Desired	Existing	Desired	Existing	Desired
Culture	1	4	3	4	3	4
Skills	2	3	1	1	1	1
Information	4	2	4	3	4	2
Technology	3	1	2	2	2	3

The results of Alhawary and Alnajjar (2008) indicated that there were no significant differences in the perceptions of academic staff at Jordanian universities in terms of the use of information systems technology for the purpose of knowledge creation and conversion. However, the results of the current research showed there was a significant difference in the perception of the two groups (staff and lecturers). Research by Jamshidi and Nemati (2008) showed that there was a significant difference between the knowledge-sharing process and social capital experience. It can be said that there was a significant difference between groups' approaches to knowledge sharing and the social capital concept (Jamshidi and Nemati, 2008). The problem appears to be related to the age of Firouzabad University (22 years), since there is a correlation between the history of the institution and its ability to respond to the challenges of the 21st century knowledge economy (Cranfield and Taylor, 2008).

In summary, there is a permanent process of change in which culture and KM both develop and influence/affect each other, whether or not the culture in question is appropriate. In both cases culture changes whether it is by formulate or involuntary. Therefore, the issue is whether the change is radical or incremental, even if it one were to overlook subcultures and neglect the debates on the impossibility of shaping culture in very compound social groupings such as international universities. In addition, reducing the technology and knowledge gap will require deliberate measures to build the scientific and technological capacities of universities.

Also, the analysis of the interviews showed that cultural differences have an impact on the meanings of KM practices, but in different ways and at different levels (Kivrak, 2009).

As result, attempts should be made to implement virtual education/e-learning, e-books, virtual libraries, e-classes, e-colleges and dual-mode e-learning, and to create research centers. Universities have three core functions:

1. Learning and teaching (increase of human capital/investment, entertainment services/consumption).
2. Scientific research (knowledge production, "theoretical/empirical") and information storage.
3. Provision of services to third parties.

Hence, some of the objectives of universities are: knowledge creation, knowledge and transfer issuance to service based on social requirements, development, culture-making, and the creation of equal opportunities. It appears that there is a need to apply various types of skill: educational skills, technical skills, social skills, legal skills and appraisal skills.

In the end, according to the literature review, the results of the questionnaires and interviews with managers and some experts and lecturers in the university, the highest scores for implementation of a dynamic network system were:

Executive information system; management information system; workgroup support system; transaction processing system; inter-organizational system; customer-integrated system; decision support system.

Conclusion

According to the findings of this study, there are observable concrete indexes, signs and evidences of KM in the fields of research, official, civil, scientific,

educational and digital facilities at the university, and they are increasing, though not very rapidly. Furthermore, from the point of view of the lecturers and staff of the university being studied, there have been advances in the parameters of KM (culture, skills and technology) in the university at average and above average level. The index of information has not been very successful in the research environment, and has been evaluated as weak. This calls for the principals of the university and other similar universities to take action. No significant relationship was found between KM and some variables such as age, gender and education. However, the study found that there was a significant relationship between KM and the groups (lecturer/staff) and years of experience. Overall, there are some strategies that could increase the effectiveness of KM in the university.

A comparative ranking of the existing condition (Table 10) was ([technology=skills] > culture > information), while the ranking of desired condition was (skill > information > technology > culture). As a result, considering the combination of the qualitative and quantitative research in this study, the overall score for KM as a whole was above average, and the development trend of KM is appropriate for the age of the university (22years). However, it is proposed that organizational knowledge should be improved or reorganized, especially in terms of the process of KM, knowledge creation, sharing, utilization and transformation, in order to bring the university up to date, and that this should be considered as a future project.

The limitations of this study were research problems in the research environment, the difficulties of generalizing the findings obtained to other similar environments, and the weakness of the research and experimental effects relating to KM. In order to rapidly establish the management of knowledge in the research environment, with reference to the findings, some theoretical suggestions were provided for the university principals and researchers, as well as some practical strategies for the managers of organizations and executive managers.

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