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## Analysis of Knowledge Management within Five Key Areas

**Authors:** Alireza ANVARI, Gholam-Abbas ALIPOURIAN, Rohollah MOGHIMI, Leila BAKTASH, Department of Industrial Management, Gachsaran Branch, I.A.U., Gachsaran, Iran, ar\_anvar@yahoo.com; alipourian\_a@yahoo.com; ro\_moghimi@yahoo.com; leila\_baktash64@yahoo.com

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*Knowledge Management as a crucial factor impacts on organizational performance. It seems to be a lack of empirical studies that measure knowledge in high educational environments, especially in universities. The main purpose of this study was to identify and assess five pointers that contribute towards knowledge management in a university in Iran. The methodology involved both qualitative and quantitative research to evaluate knowledge management based on literature and personnel viewpoints in the university. Data from 101 participants were analyzed by using Kruskal-Wallis, and Mann-Whitney test. The instrument used was a structured research questionnaire on knowledge management.*

*The analysis showed that all five parameters had an effect on knowledge management. The results imply that the university is following a trend towards knowledge-orientation. Furthermore, there was a significant difference between two groups (lecturer and staff) perception. Its implication can also be beneficial to other universities that plan to highlight knowledge-oriented management.*

**Keywords:** Knowledge Management, Information Management, Evaluation Method, Five-Indicators

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## Introduction

A review of current business literature reveals that knowledge management (KM) has become a crucial factor in competitive environments. According to Bhatt [1], business and academic communities believe that the process of leveraging knowledge can provide an organization with long-term competitive advantages. Obviously, universities are no exception; they are centers for production and leveraging of knowledge. Islamic Azad University – Gachsaran Branch (IAU-G.B.), as a center of knowledge, wants to implement KM so that it can develop the potentialities and commitment of skilled employees through identifying methods for creating, recognizing, implementing, leveraging and distributing organizational knowledge. This would mean a KM emphasis on the creation, utilization and development of their collective intelligence [2].

This research initially focused on identifying assessment measures of KM and their strengths and weaknesses. This study then investigated the relationship between KM in the field of management and infrastructure of IAU-GB, its variables including the general management, the leadership style, strategic vision, internal processes, and human resources, as well as factors such as the type of the groups (lecturers and other staff), job levels, and gender (Figure 1). At the same time, the study aimed to clarify whether it is possible to provide strategies for making KM more effective. The research methodology used qualitative and quantitative methods. The aim of this research, using qualitative methods, was to address the following questions in a literature review:

- What measures are used to evaluate KM?
- What are the variables in KM evaluation?

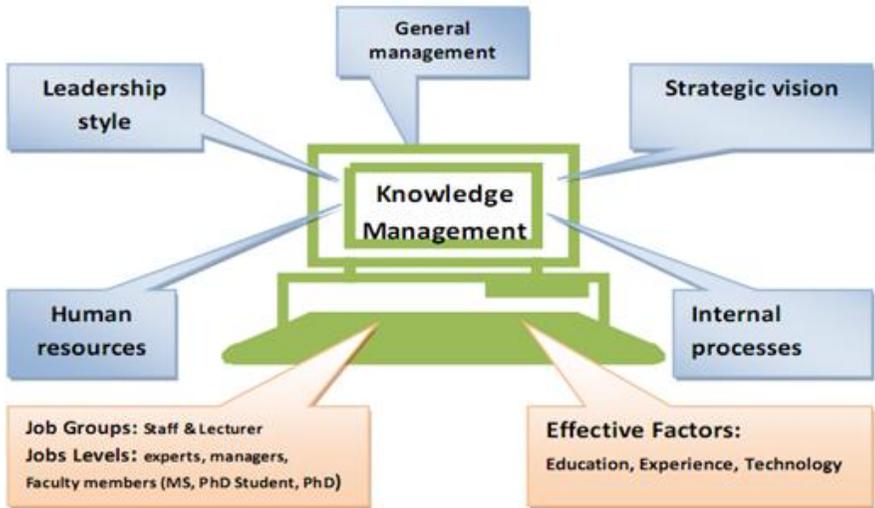
And, qualitative methods based on a case study addressed two questions:

- What is the level of KM from the perspective of employees?
- Are there any significant differences between the two groups (lecturer and staff)?

The structure of the paper is as follows:

Section 2 presents an outline of the literature review in the form of a table (Table 1) that lists the researchers of KM. moreover in this section, a general evaluation of KM and the categorization of their metrics and variables. The methodology and the case study are described in Section 3. Finally, Sections

4 and 5 present a discussion, some concluding remarks and suggestions for universities regarding the implementation of KM.



**Figure 1:** A Conceptual Diagram of Five-Parameter Modeling of KM

## A Review Study of Knowledge management

In recent years, researchers have focused on KM and have attempted to support organizational knowledge, such as: Sommerville and Dalziel [3], Goffee and Jones [4], Hwang [5], Albers and Brewer [6], Goh [7], Fernandez et al. [8], Gumus [9], Kayakutlu and Buyukozkan [10], Wen [11], and so on. Hence, KM has been categorized according to the authors' different approaches (see Table 1).

## Assessing Knowledge Management

According to the literature, there are nine perspectives for KM measurement (Table 2). Mostafa Jafari et al. [55] identified 33 measurement methods of knowledge and intellectual capital. They classified them into four groups: direct intellectual capital, score card, marketing cost methods, and return on assets. Khadivar et al. [74] classified the studied measurement methods into three approaches (from an area-based perspective): knowledge

measurement in products and processes, measurement of knowledge value in internal organization, and measurement of organizational conditions based on KM processes.

Moreover, Chang and Wang [59] classified the measurement methods into seven approaches (from a factors-based perspective): employee traits, strategy factors, superintendent traits, audit and assessment, organizational culture, operating procedures, and information technology. In addition, Adli [76] proposed 4 key indicators (context, input, process and output indicators); Vlok [82] stated 14 dimensions in 3 process-based areas: background/structural factors, knowledge production and knowledge integration; and Wen [11] offered 5 criteria for KM: data, information, knowledge, wisdom, and Staff; and so on. As a result of the literature review of KM performance evaluation, we can classify some of these review findings into several perspectives (see Table 2).

**Table 1:** Different Approaches to KM

No	Issues	Resources
1	Study on theory and	[12- 36]
2	Relationship between KM	[1, 37- 45]
3	Competitive advantages of	[1, 2, 23, 25, 26, 33 59]
4	Categorization of KM	[29, 40, 61 -75]

## Knowledge Management in High Education

Knowledge systems are core elements of a manager's requirements for organizing, controlling, participating, and combining systems of structures, processes, and people [35]. For this reason, many authors have studied the different facets of knowledge [33, 34, 36, 59, 83], but it seems that the creation and utilization of knowledge is the most important challenge.

Universities are the main centers for producing and leveraging knowledge [56]. Through the use of KM, universities will be able to perform more effectively by spreading knowledge among cultures, and expanding the process of learning and teaching to overseas universities [53].

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Therefore, we need to establish what KM is and organize it into categories so that we can gain a conceptual understanding, and prepare the appropriate context for the creation of software concepts. Due to the appearance of new knowledge producers in the education sector, more and more universities are looking into the possibility of applying corporate KM systems [2]. In this case, there are some factors which affect the success of KM in a university: leadership, the nature of academic other staff, evidence of the benefits, the taxonomy for the application of KM within the university, management structure, and the history of the university [83]. Hijazi and Kelly [42] claim that KM can help to solve problems between industry and a university, such as: align IT with social networks and dealings, encourage and support the use of KM, allow knowledge transfer across different tasks, apply knowledge to workers' management and practice tacit knowledge within their surroundings. Abdullah et al. [81] proposed a framework for a KM system: psychological – motivation, awareness, reward, strategy; culture – truth, beliefs, value, experience; process – acquisition, store, disseminate, use; functionality – agent, email, video conferencing, chats; architecture – application, technology, infrastructure, repositories.

## **Evaluating KM at Universities**

Regarding KM in universities, Sar karani [53] focused on the challenges of Japan and the prerequisites for the internationalization of universities as well as their duties of producing knowledge and KM. Jamshidi and Nemati worked on 'knowledge share and experience' in social capital development within IT units in universities, and their results showed that there was a significant difference between the knowledge share process and social capital experience [84]. In this study, the indexes to evaluate the success of a KM system have been provided by a questionnaire. In this case, a combination of indexes was introduced in the questionnaire as suggested by Rampersad [85].

**Table 2: KM perspectives and metrics**

Perspective	Indicators / Metrics	N	Res
Analysis-based	<ul style="list-style-type: none"> <li>Qualitative analysis, quantitative analysis, non-financial indicator analysis, financial indicator analysis, internal performance analysis, external performance analysis, project-orientated analysis, organization-orientated analysis</li> </ul>	8	[36]
Area-based	<ul style="list-style-type: none"> <li>Knowledge measurement in products and processes, measurement of knowledge value in internal organization, measurement of organizational conditions based on KM processes</li> </ul>	3	[74]
Factors-based	<ul style="list-style-type: none"> <li>Employee traits, strategy factors, superintendent traits, audit and assessment, organizational culture, operating procedures, information technology</li> </ul>	6	[59]
Indicator-based	<ul style="list-style-type: none"> <li>Context indicator, input indicator, process indicator, output indicator</li> </ul>	5	[76]
	<ul style="list-style-type: none"> <li>Knowledge or information quality, perceived knowledge management system (KMS) benefits, user satisfaction, and system use were used as dependent variables in evaluating KMS success</li> </ul>	4	[43]
Method-based	<ul style="list-style-type: none"> <li>Marketing cost methods, return on assets, direct intellectual capital, score card</li> </ul>	4	[77]
	<ul style="list-style-type: none"> <li>The balanced score card, economic value-added, Skandia Business Navigator</li> </ul>	3	[78]
	<ul style="list-style-type: none"> <li>Direct intellectual capital, score card, marketing cost methods, return on assets</li> </ul>	4	[73]

Metrics-based	<ul style="list-style-type: none"> <li>Benchmarking focus, performance measurement focus, Skandia Business Navigator, value focus</li> </ul>	4	[79]
Model-based	<ul style="list-style-type: none"> <li>Cognitive model, network model, community model, quantum model, philosophy-based model, general intellectual capital (IC) measurement model</li> </ul>	6	[57, 71]
Parameters-based	<ul style="list-style-type: none"> <li>General management, leadership style, strategic vision, internal process, human resources</li> </ul>	5	[80]
	<ul style="list-style-type: none"> <li>Psychological, culture, process, functionality, architecture</li> </ul>	5	[81]
	<ul style="list-style-type: none"> <li>Technology, process, people</li> </ul>	3	[57]
	<ul style="list-style-type: none"> <li>People, structures and processes</li> </ul>	3	[35]
Process-based	<ul style="list-style-type: none"> <li>Knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application activities, knowledge capitalization, knowledge balancing</li> </ul>	6	[1]
	<ul style="list-style-type: none"> <li>Background/structural factors, knowledge production, knowledge integration</li> </ul>	3	[82]
	<ul style="list-style-type: none"> <li>Knowledge creation, knowledge accumulation, knowledge sharing, knowledge utilization, knowledge internalization</li> </ul>	4	[75]
	<ul style="list-style-type: none"> <li>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</li> </ul>	3	[30]

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## The Specific Research Questions

The research questions of the study were as follows:

- What is the level of KM based on the main parameters at this university?
- Is there a significant difference between demographic factors such as: groups of the study (lecturer and other staff), job levels, and KM?
- How can KM be practiced at this university?
- How should the strategies be provided for enhancing effectiveness of KM in IAU-GB?

## The Research Methodology

This study was based on a survey that involved all the lecturers and other staff of IAU-GB. The population was 135 and the Kokaran model of sampling was used. Data obtained from the sample 101 participants were analyzed. In this study, descriptive statistics methods such as percentage, mean and so on were used, and depending on the type of variable, Kruskal-Wallis test, Mann-Whitney and correlation coefficient tests were applied for investigating the correlation.

### Research Hypotheses:

1. There is a relationship between an adequate 'general status of management' and KM.
2. There is a relationship between leadership style at IAU-GB and KM.
3. The more a university follows proper strategic outlooks, the more easily KM is achieved.
4. The internal management procedures at IAU-GB help establishes KM.
5. There is a relationship between the status of human resources and KM.

To test these hypotheses, KM was defined on 5 parameters. Then, due to the fact that the data were of ordinal scale, non-parametric Kruskal-Wallis Test was applied to obtain the mean of the 4 groups in every 5 variables of KM. All the hypotheses were tested and are summarized in

Table 8. Of course, with regard to the ordinal mean in each of the 4 groups in all 5 management parameters, it can be concluded that the more the means of the parameters are, the more easily KM is achieved.

### Participants

Questionnaires were sent to employees with positions of significant responsibility to measure the level of KM. 120 lecturers and other staff were selected through stratified random sampling and investigated through a standardized instrument designed by the researchers for management of knowledge. The collected data was analyzed using SPSS. The Kruskal-Wallis test, Mann-Whitney test and Spearman correlation tests were also applied. From 120 questionnaires distributed, 101 employees completed and returned their questionnaires, resulting in 101 (47 other staff and 54 lecturers) usable responses (see Table 3).

**Table 3: A Demographics Frequency of Participants**

Demographics	Gender		Field study			Job groups		Job levels				
	Male	Female	Human sciences	Basic sciences	Engineering	Staff	Lecturer	Manager	Expert	Lecturer		
										M S	Ph D-stu	Ph D
No	68	33	62	14	25	47	54	15	32	25	10	19
%	67.3	32.7	61.4	13.9	24.8	46.5	53.5	14.9	31.7	24.8	9.9	18.8

## Sampling Design

Five sets of measures were adopted and used to measure each of the five constructs, namely, general management, leadership style, strategic vision, internal process and human resources. These measures were made by integrating Rampersad test [85], and were subjected to a formal pre-test by some managers and experts.

An internal consistency analysis was performed separately for each variable in the theorized model by calculating the Cronbach's alpha. The results in Table 4 show that the Cronbach's  $\alpha$  for all the variables in the model were above the critical value of 0.7 [86]. Hence, the authors concluded that all the items had been appropriately assigned to each variable. The instrument developed also had content validity, because 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 created the measurement items to cover the content domain of the variable being measured [86]. The study used a five-point rating scale, i.e. from 1 (strongly disagree) to 5 (strongly agree). The reliability alphas ( $\alpha$ ) of different variables and sample items for each variable are discussed as follows.

**Table 4:** Statistical Information

Parameter	No of Items	Cronbach's Alpha	Mean	Correlations	Sig
General Management	13	.77	38.454	.710**	.000
Leadership Style	7	.77	22.3335	.728**	.000
Strategic Vision	5	.79	15.3665	.736**	.021
Internal Process	7	.77	19.9206	.745**	.025
Human Resources	7	.83	19.7428	.785**	.001
KM Total	39	.90	23.1635		

## Findings of the Study

Correlation and validity of the instrument's statements were achieved through the Cronbach method, the correlation for all the subscales of KM were high and significant at 0.01, but note the correlation for the indicators of human resources in the first rank ( $r=0.785$ ), and general management ( $r= 0.710$ ) is last rank (see Table 4).

Also, the maximum Cronbach belongs to human resources (.83) and among the indicators, general management, leadership, and internal process are least (0.77), and strategic vision is .79. Fortunately, the reliability alphas of Total KM (0.90) were very strong, and the alpha value of 90% indicates that the research instrument has a high validity.

## Description of Data

Table 5 shows Mean, SD, Skewness and Kurtosis of 5 parameters: general management, leadership style, strategic vision, internal process, human resources and total of KM.

**Table 5:** Descriptive Statistics

Five Parameters	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
General Management	101	2.9580	.42427	-.032	.240	-.935	.476
Leadership Style	101	3.1905	.61714	-.289	.240	-.949	.476
Strategic Vision	101	3.0733	.59513	.082	.240	-.444	.476
Internal Processes	101	2.8458	.51968	.031	.240	-.388	.476
HUMAN RESOURCES	101	2.8204	.71419	-.213	.240	-.871	.476

The total KM scores of the participants are illustrated in the form of a histogram and a normality distribution in Figure 2. In fact, the normality distribution of the assessed variables was based on Kurtosis and Skewness (Table 5), the result of exploratory analysis showed an excellent normality KM scale.

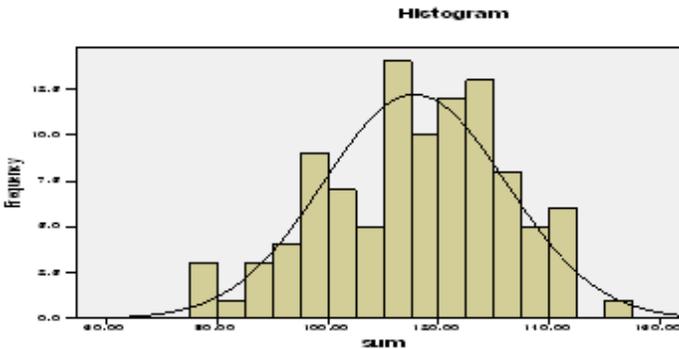


Figure 2: Normal Distribution

## The Score of Parameters

As can be seen in Table 6, the means of the parameters of other staff, lecturers, and total participants, are different. They are discussed below:

- Staff – The total mean of the 5 parameters that were indicative of KM was 2.73, and the highest mean belonged to strategic vision (2.93) and the lowest mean was 2.40 for human resources.
- Lecturers – The total mean for the 5 parameters measuring KM was 3.19, which is more than the average score. The highest mean was 3.46 and belonged to leadership style, and the lowest mean (3.04), belonged to internal process.
- Other staff and lecturers – The total mean of 5 parameters was 2.98. The parameter for leadership style had a high mean of 3.19. The mean for the parameter of internal process was lower than average (2.82).

In general, the respondents level of leadership style and strategic vision is more than average, in other words, they are satisfied with the system aspect of leadership style and strategic vision. However responses to

the other parameters (general management, internal process, and human resources) are less than average.

**Table 6:** An Analytical Survey of parameters

Parameter		General management	Leadership style	Strategic Vision	Internal process	Human resources	Total mean
mean	staff	2.8156	2.8845	2.9277	2.6201	2.4012	2.73
	Lecturer	3.0820	3.4568	3.2000	3.0423	3.1852	3.19
Total mean		2.9580	3.1905	3.0733	2.8458	2.8204	2.976

### Data Analysis

The main objective of this research was to identify and investigate the pattern for establishing a KM at university. In the other words, this research sought the answer whether there are any signs observed at the University of knowledge-based Management and how can this new and efficient pattern be implemented or strengthened at the university?

The minor objectives of the study included studying the demographic features of gender, age, education, and the groups of the study (lecturer and staff) as well as studying the parameters of knowledge-based management such as the general style of management at university, the leadership style, the strategic vision, the internal processes of management, and investigating the status of human resources at university.

According to the results shown in Table 7, there are significant differences between the approach of other staff and lecturers to KM parameters. In addition, the ranges of SD in measures show differences between the two groups. It seems the approach of lecturers were concentrated. So, it was assessed that lecturers had a more positive approach because they have more information and deeper/wider vision.

**Table 7: Mann-Whitney Test – Group Statistics**

Items	Position	N	Mean	SD
General management	staff	47	40.84	.34881
	Lecturer	54	59.84	.44765
Leadership style	staff	47	36.54	.56646
	Lecturer	54	63.58	.53368
Strategic vision	staff	47	43.67	.52985
	Lecturer	54	57.38	.62405
Internal process	staff	47	37.65	.45788
	Lecturer	54	62.62	.49302
Human resources	staff	47	33.85	.61599
	Lecturer	54	65.93	.58451

According to the results of the Kruskal-Wallis Test in which the significance value is less than 0.05, the null hypothesis that there is no relationship between these 5 parameters and KM is rejected and all 5 parameters are proved to have a direct positive relationship with KM (Table 8).

**Table 8: Kruskal-Wallis Test**

	General	Leadership Style	Strategic Vision	Internal Processes	Human Resources
Chi-Square	88.982	21.100	9.758	9.329	16.320
df	3	3	3	3	3
Asymp. Sig.	.000	.000	.021	.025	.001

## Hypothesis Test

### H-1, There is a relationship between gender and KM

To test this hypothesis, a non-parametric Mann-Whitney Test, needs to be conducted for two independent male and female groups:

Table 9 shows the results of tests and allows comparison of the means for female and male groups in 5 management parameters. Because the significance is  $<0.05$  the null hypothesis is rejected and there is a significant difference observed between female and male groups. As can be seen, only for general management and strategic outlook parameters were there no meaningful differences between male and female groups. However, there was a significant relationship between gender and other parameters of KM.

**Table 9: Mann-Whitney Test**

Test Statistics <sup>a</sup>					
	GENERAL	LEADERSHIP HIPSTYLE	STRATEGIC VISION	INTERNAL PROCESSES	HUMAN RESOURCES
Mann-Whitney U	882.000	785.000	906.000	737.000	630.500
Wilcoxon W	3228.000	3131.000	3252.000	3083.000	2976.500
Z	-1.741	-2.448	-1.572	-2.803	-3.566
Asymp. Sig. (2-tailed)	.082	.014	.116	.005	.000

a. Grouping Variable: sex

### H-2, There is a meaningful relationship between groups of the study (staff and lecturers)

To test this hypothesis, a non-parametric mean for two independent groups (the other staff and lecturers) should be applied. Because the questions were of ordinal scale, non-parametric tests for ordinal data should be conducted. In this study, a non-parametric Mann-Whitney Test was used (Table 10). This test is intended to identify whether KM is identical for the groups of lecturers and the other staff.

**Table 10: Mann-Whitney Test**

	GENERAL	LEADERSHIP STYLE	STRATEGIC VISION	INTERNAL PROCESSES	HUMAN RESOURCES
Mann-Whitney U	791.500	589.500	924.500	641.500	463.000
Wilcoxon W	1919.500	1717.500	2052.500	1769.500	1591.000
Z	-3.258	-4.641	-2.358	-4.296	-5.499
Asymp. Sig. (2-tailed)	.001	.000	.018	.000	.000

a Grouping Variable: job

The above table tests and compares the means for 5 parameters of KM in the two groups: lecturers and other staff. Because the significance is  $<0.05$  the null hypothesis is rejected and this shows that there is a significant difference between the two different groups of employees. As observed, there is a significant difference between two groups of employees in all 5 parameters of KM.

### **H-3, There is a relationship between groups of employees and KM**

The means of the 5 management parameters in 5 groups of employees are compared in Table 11. Due to the ordinal nature of data, a non-parametric Kruskal-Wallis Test was implemented. The degree of confidence was less than 0.05 and this implies rejection of the null hypothesis. As observed, there was no significant difference found between the means of groups except for the strategic outlook parameter; however, there was a meaningful difference reported for all the remaining parameters in KM.

**Table 11:** Kruskal-Wallis Test

Test Statistics <sup>a,b</sup>					
	GENERAL	LEADERSHIP STYLE	STRATEGIC VISION	INTERNAL PROCESSES	HUMAN RESOURCES
Chi-Square	15.204	23.560	8.147	21.537	30.989
df	4	4	4	4	4
Asymp. Sig.	.004	.000	.086	.000	.000

a. Kruskal Wallis Test

b. Grouping Variable: JobGroup

## Discussion

KM is an important strategy for improving performance and organization competitiveness [25, 26]. However, how to evaluate KM organizations has become one of the most crucial issues in KM [34]. The literature shows that most of the theories, research, and studies of KM are for determining indicators / parameters / metrics and methods of measurement, but hardly any effort has been applied to measure KM across a range of criteria.

As shown in Table 6, one of the main problems of the university is lack of procedure and suitable organizational structure to support internal processes. Wen [11] showed that “procedures, persons, supporting organizational structure and IT” are four key successes of KM. In addition, in a ranking by Wen [11], the priority of criteria was identified: information, staff, wisdom, knowledge and data. In our research, the lowest score was given to human resources (knowledge transfer, team working and performance assessment) and internal process (available knowledge, measure knowledge gaps, and exchange knowledge). Also, the least scores of other parameters are: Strategic vision: knowledge and performance in the corporate scorecard; Leadership style: identify and solve shared problems as a team, focus on developing employee knowledge; General management: network of knowledge employees, competition between colleagues. By contrast, the maximum of mean scores related to: effort directed toward improvement, learning by doing, committed top management to creating a learning organization, perception of knowledge important, customer information as strategically valuable, and knowledge exchange.

In addition, there are many problems regarding knowledge-based management, but the results show that leadership style is acceptable and the organization has the strategic vision to implement KM successfully.

Alhawary and Alnajjar's [45] findings indicated that there were no significant differences in the perception of academic staff at Jordanian universities for the use of information systems technology regarding the purpose of knowledge creation and conversion. By contrast, our research showed a significant difference in the perception of two groups (other staff and lecturers). Furthermore, the results of "Jamshidi and Nemati" showed a significant difference between knowledge share process and social capital experience. They also reported a significant difference between groups' aspects of knowledge share and social capital concept [84]. It seems that some of the problems were related to the history of the university (26 years) because there is a correlation between the history of the institution and its ability to respond to the challenges of the knowledge economy of the 21st century [83].

## Conclusion

With regard to the findings, in sum it can be stated that there are observable concrete indexes and evidences of KM in the fields of research, official, scientific, educational, digital facilities, at the university and they are increasing slowly. Also, from the point of view of the lecturers and other staff of the university under study, there have been advances in the parameters of KM especially in strategic vision and leadership style at the medium and above medium level. Indexes of internal process, human resources, and general management of KM have not been very successful in the research environment and have been evaluated to be weak. This calls for the principals of IAU-GB and other similar universities to take action. There was no significant relationship found between KM and variables of gender (with the exception of general management and strategic vision). However, there was a significant relationship between KM and groups (other staff and lecturers) of the study. Furthermore, there was a significant relationship between KM and job levels (with the exception of strategic vision).

When considering the combination of this qualitative and quantitative research, it seems that the total of O-KM was less than average,

but the trend of development of KM was suitable (26 years). Fortunately, leadership and strategic vision were above average, and the general management situation was about average. Therefore, it is proposed that internal process and human resources should be improved or be re-engineered.

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