

KM Factors Affecting High Performance in Intermediate Colleges and its Impact on High Performance - Comparative Study

Samy S. Abu Naser*, Mazen J. Al Shobaki, Youssef M. Abu Amuna

Faculty of Engineering & Information Technology, Al-Azhar University, Gaza, Palestine

Keywords	Abstract
Knowledge Management, KM Maturity, High performance, Intermediate Colleges, Asian Productivity Model	This paper aims to determine knowledge management (KM) factors which have strong impact on high performance. Also, the study aims to compare KMM between intermediate colleges. This study was applied on three intermediate colleges in Gaza strip, Palestine. Asian productivity organization model was applied to measure KMM. Second dimension which assess high performance was developed by the authors. The controlled sample was 190. Several statistical tools were used for data analysis and hypotheses testing, including reliability correlation using Cronbach's alpha, "ANOVA", simple linear regression and step wise regression and LSD test. The overall findings of the current study show that maturity level is in the second level. Findings also support the main hypothesis and its sub-hypotheses. The most important factors effecting high performance are the processes, KM leadership, people and KM outcomes. In addition, there are differences in high performance for college (PTC). Furthermore, the current study is unique by the virtue of its nature, scope and way of implied investigation, as it is the first comparative study between intermediate colleges in Palestine that explores the status of KMM using the Asian productivity model. Research limitations was that the survey findings were based on intermediate colleges in Gaza Strip.

1. Introduction

Knowledge management in intermediate colleges is the main aim of those organizations, where they produce and manage knowledge through human activities and technical practices to link individuals from various administrative levels and sections.

This process establishing working groups and trust relationships which produce share and exchange of knowledge they own, support individual and collective learning processes, and then improve and develop individual and organizational performance.

Measuring KMM is an important process and the purpose of the measurement should be obvious and within right criteria based on successful experiences with the capability to recognize knowledge gaps that must be remedied in order to take full advantage of the knowledge [1, 2].

The objective of this study is to measure and compare KMM in HEI. Also the study aims to define KMM level to encourage them moving to a higher level.

In view of the literature review, the study raises the question of:

Q1. What are the most influential factors on intermediate colleges' performance resulting from KMM?

Q2. How to link KMM with performance and benefit from it for future performance improvements?

Q3. Are there any differences in high performance related to intermediate college?

As for originality, the current study is unique by the virtue of its nature, scope and way of implied investigation, as it is explore the differences in high performance at intermediate colleges using KMM.

2. Literature Review

2.1. knowledge Concept

During the past two decades, knowledge and information are considered as the most important resources of creating value and the most important factors for creating competitive advantage, as a result, they have been changed into necessary activities [3, 4].

* Corresponding Author:

E-mail address: abunaser@alazhar.edu.ps – Tel, (+970) 599783837 – Fax, (+970) 82641888

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Knowledge in an organization can be broadly classified into two categories: explicit and tacit knowledge. Explicit knowledge is that which can be measured, captured, examined, and can easily be passed onto others in a codified format—a formal and systematic language. Tacit knowledge, on the other hand, is highly personal, context-specific and comes from one's experience. It is hard to measure, capture or examine. Since knowledge is valuable it should be managed and utilized wisely [1, 5].

Knowledge has been recognized as a valuable organizational resource and a foundation for competitive advantage in today's business environment. Its value is magnified by it being closely related to another important organizational resource in today's dynamic global markets – time [4, 6, 7].

Today's organizations are viewed as wellsprings of knowledge and thus cannot afford to lose time or looking for old knowledge they are unable to retrieve by trying to know what they know [6, 8].

2.2. Knowledge Management Importance

The rapid growth of data and technologies trigger the transformation of data to useful information, known as knowledge. Nowadays, people are aware of the worth of knowledge and the styles to obtain, recognize, capture, save and leverage it, so that knowledge can be shared without losing it; in the other words know how to manage knowledge. In this way the term of KM is created [6, 9].

Knowledge Management (KM) is a process where organizations have formulated ways in the attempt to recognize and archive knowledge assets within the organization that are derived from the employees of various departments or faculties and in some cases, even from other organizations that share the similar area of interests or specialization [9, 10].

Knowledge management, which can produce the power of compatibility and survival for organizations, is based on the attraction and productivity of knowledge and its management. But, for organizations which are to be responsible in the today's developing information world and have competitive positions, it is vital to experience the access to processes of knowledge management, practically [5, 8, 9].

Nowadays, organizations entering a knowledge community in which the main economic resources are no longer considered as capitals, natural resources, or working, but it is knowledge and knowledge-based staff which have main functions [1, 3, 8].

For many organizations improving performance is not only dependent on the successful deployment of tangible assets and natural resources but also on the effective management of knowledge [11, 12].

Technology infrastructure, organizational structure and organizational culture are linked to the organization knowledge infrastructure capability; and knowledge process (obtain, recognize, capture, share, save and leverage) are linked to the organization knowledge process capability. Taken together, these resources determine the knowledge management capability of the organization, which in turn has been linked to various measures of organizational performance [5, 10, 11, 13].

2.3. Knowledge Management in Intermediate Colleges

Intermediate colleges are cognitive intensity institutions where the primary function is based on knowledge, production of knowledge, documentation and publishing. There is a growing belief that knowledge management in educational institutions help build the future of a dynamic learning environment, development and improvement of the efficiency activities of knowledge sharing and improve the overall performance of the organization [3, 14-26].

Ramachandran et al. defined KM in HEI as the systematic attempt to develop and implement knowledge practices in universities with the support of major strategic assistance factors [6]. Also, as defined by Petrides and Nodine [27], it is a frame or a way for individuals working in the educational institution to develop a set of practices to gather information and share what they know, which resulting in behaviors or actions that will improve the level of services and products offered by the educational institution.

Laal defined it as the process of converting information and intellectual assets to a continuing value that connect individuals with the knowledge they need to take action when they need it [9].

According to the previous definitions, KM in HEI is similar knowledge management in industrial organizations or services, in terms of operations and activities, with a focus on the link between individuals and management to enhance the quality of outputs and achieve a competitive advantage in performance and outputs. HEI offer their services primarily to the community, and represents members of the community the main beneficiaries of universities. Researchers identified the most reasons why HEI environment is the most suitable to adopt KM as the existence of technology infrastructure, confidence and knowledge sharing is normal in universities and students enroll in a college to access to knowledge [14, 17, 28-32].

Critical factors for KM in intermediate colleges:

The most critical variables that has an effect on sharing knowledge in universities are benefits and rewards [17, 33]. Hislop suggests that the issues that concern to the staff regarding to assessment of advantages and disadvantages of sharing knowledge [34]. Benefits can be real rewards which improve the organization's performance and stability. Rahman et al. and Bock et al. pointed that social sharing benefits cannot be estimated quantitatively; instead it is a personal commitment, trust and gratitude [5, 35].

Leadership style is an additional important factor which plays an essential role in endorsement and development of knowledge exchange behavior, by contributing in experiential learning for staff, providing opportunities for supervising operations, development information technology systems, rewards and opportunities and interaction systems [2, 12, 33, 36, 37].

The role of the leader can be completely different in the educational institutions where there are two types of leadership: academic and hierarchical management leadership. Significant tensions can exist when people with administrative capacity control the academic environment [38].

There is an immense dispute about the role of culture in educational institutions in the field of knowledge management and exchange [1, 2, 10-12, 33].

It has been indicated that the academic departments are complex and cultures may be different among departments in different disciplines [10]. The fact that remains dominant here is that the academic community has a culture of participation more than other forms of organizations and that cooperation is the essence of knowledge management [17, 39].

One more important factor is organizational structure [1, 2, 10]. This structure might be a major difficulty for the exchange of knowledge. For that reason, organizational structure should be flexibly designed to persuade participation and cross-border cooperation inside the organization. The combination between formal organizational structure and non-hierarchical structure enhance knowledge generating and sharing [2, 33, 40, 41].

High performance in intermediate colleges:

Intermediate colleges are service organizations providing education and knowledge. They are also responsible for providing the society with qualified people for jobs, so they deliberately to achieve high performance in their activities by teaching process.

This performance measured by many excellence models such as BSC, Malcolm Baldrige American model, European model and Canadian model [42]. Those models depend on several criteria, leadership, strategic planning, customer orientation, KM, human resource, operations Management and the outcomes.

Also the scales might be financial or non-financial. Lee and Teseng pointed that financial scales connected directly with long term objectives, measuring the success of strategic plans and the ability to adapt with changes in external environment. Financial scales consist of ROI, sales growth, income before taxes, net profit, ROA, etc. [43].

While operational scales provide a hidden image for performance such as new products, product quality, market share, innovation, customer retention, social responsibility [8, 44].

Al-hady defined high performance in universities "The performance that helps in achieving strategic objectives and effectiveness according to quality scales". KM can improve this performance in high rates [27, 45]. Rani, Sania, AL-Hayaly and Alnajjar added that KM positively affects organizational outcomes of organization innovation, product improvement and employee improvement [46, 47].

These researchers [14, 29, 48-49] mention the main fields of high performance in universities:

- **Reduce costs and increase profits:** Educational institutions seeking to cut costs by reducing the costs of services provided to students and the level of operational and administrative costs of operations, leading to an increase in profits.
- **Improve Quality:** The overall quality management approach depends on the joint efforts by which the participation of all individuals on an ongoing basis to improve the institution's performance.
- **Scientific research:** Scientific research in educational institutions is the key element of high performance which

helps in the advancement of professional practice and gains the confidence of the industry, and demonstrates the intellectual contributions of the faculty member.

- **Community Service:** It is an essential element in evaluation process of high performance that clarifies the role of the institution in civil society service and its contribution to solving its problems.

2.4. Knowledge Management Maturity

KMM determines the level of organization existing capacity affecting on knowledge management processes, where every organization particular track a special sequence of maturity. Knowledge management maturity models describes the steps of growth, which is expected to be up to the organization to develop their knowledge management and organizational performance [17, 50]. Also it determines the stages of institutional knowledge maturity, which is expected to pass by any institution on its way to improve their practices and competitive advantages and thus improve the overall performance of the institution [51].

The importance of knowledge management measurement can be determined as follows [52, 53]

- Helps measure the institution to identify knowledge gaps they have.
- Determine the impact of knowledge gaps on the performance, growth and development of the institution.
- Helps to manage knowledge possessed by the organization more efficiently.
- Provides the enterprise with analytical tools works to promote knowledge and address gaps.
- Identify strategies and activities to fill those gaps in knowledge.

Asian productivity organization developed a model to measure KMM, designed after a study lasted for five months. This model has been adopted by the Asian Organization of Production (APO) to develop tools and knowledge management techniques. Working team consist of experts in knowledge management from Japan, Singapore, India, China, Malaysia, Thailand, Vietnam and the Philippines [54]. This model consist of a general framework for knowledge management, knowledge management tool and measuring tool to measure the maturity of knowledge management as shown in Figure 1.

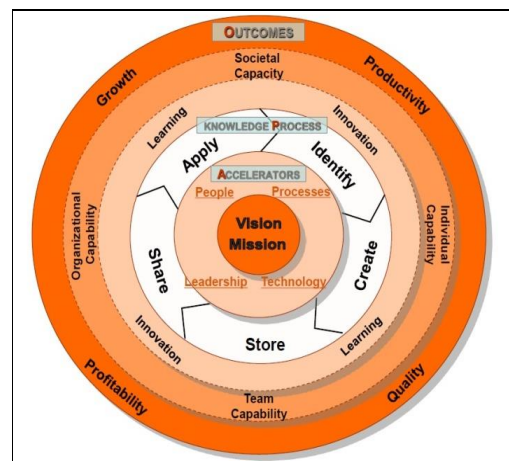


Figure 1. KM framework

This framework consists of a row of enablers for knowledge management, starting from the organization's mission and vision in the middle of the circle, which sets strategy and organization capabilities.

Then we move on to the second frame, which includes knowledge management processes and the factors that accelerate the processes of knowledge management like leadership, individuals, processes and technology. In the last phase, the results of using knowledge management are

represented by quality, productivity, profitability and growth of the organization.

The model defined seven fields to measure KM: KM Leadership, process, people, technology, knowledge process, learning and innovation and KM outcomes as in Figure 2.

After measuring KM, the results showed on a radar chart identifying the areas that have strength and the areas that need improvement and the organization has an opportunity to improve them.

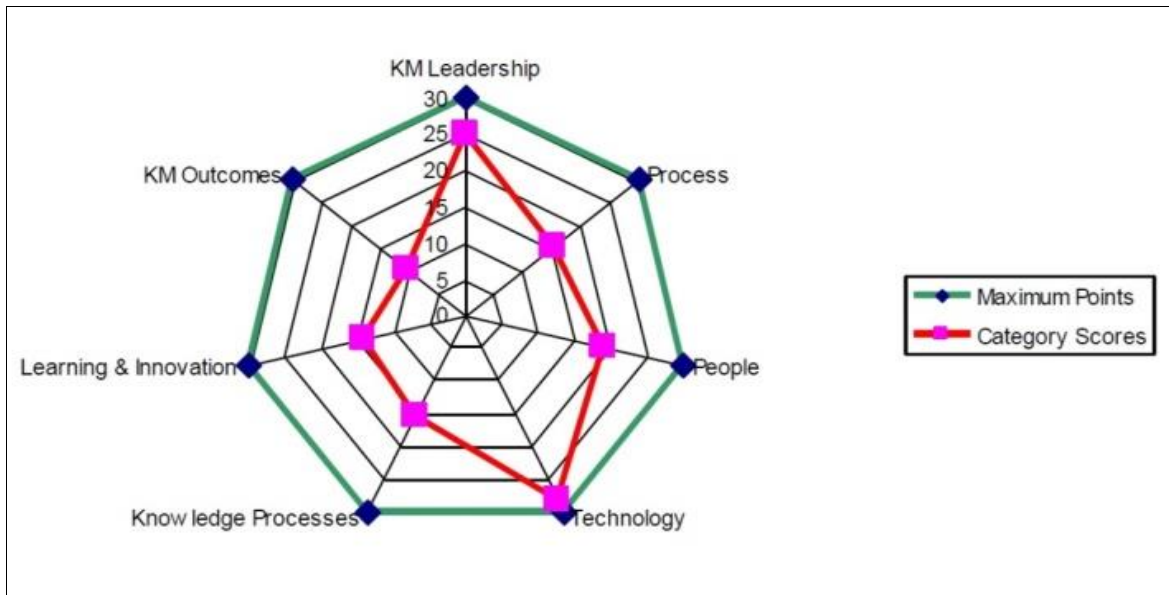


Figure 2. Radar Chart

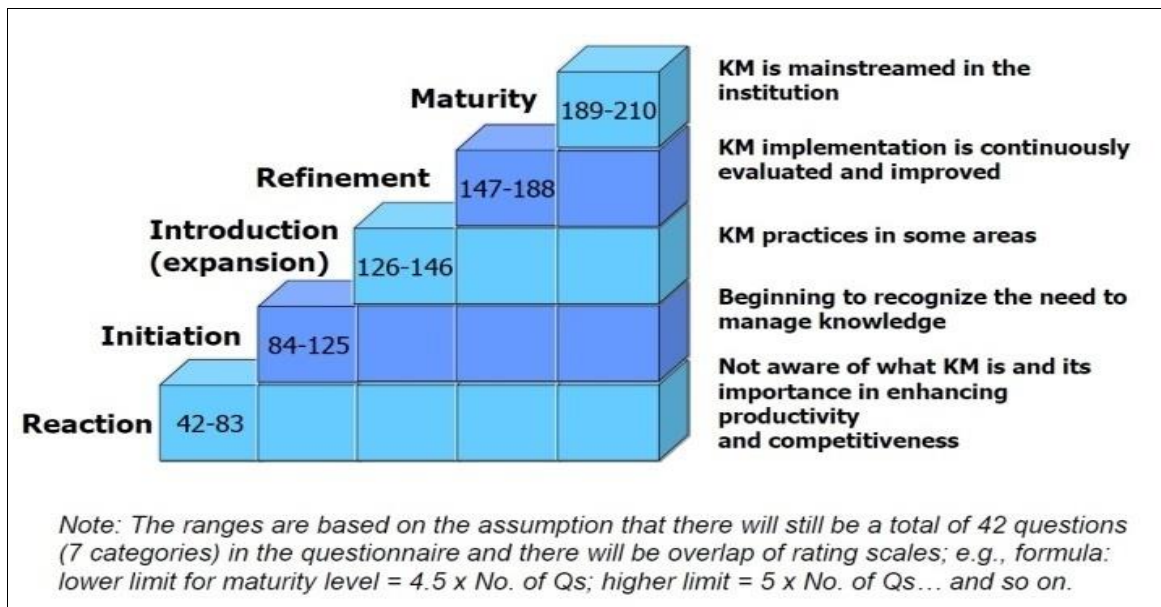


Figure 3. Maturity levels model

The next step is to determine the level of maturity of knowledge management in the organization and comparing it with the maturity levels model.

Knowledge management maturity consists of five levels are composed as follows (as shown in Figure 3)

- 1- Reaction: The organization is not interested in knowledge management and focused on enhancing productivity and competitiveness.
- 2- Initiation level: The organization begins to realize the need for knowledge management or has already begun in a pilot project for knowledge management.

- 3- Expansion: Knowledge management is fully applied.
- 4- Refinement: Organization evaluates knowledge management on an ongoing basis.
- 5- Maturity level: Knowledge management exists primarily as a driver in every organization's process.

2.5. KMM and High Performance

Knowledge management is not the only factor affecting performance and output of the organization, but it is one of many factors. Factors enabling high performance are leadership style, strategic planning, measurement, analysis, knowledge management, customers oriented, human resource management and administrative processes [13].

In first or second level of maturity, KM operations are local and lead to focus on a particular section in the organization without a comprehensive strategy to support those efforts. Here we can say that the impact of KM processes is not dramatically evident on the organization's performance. Therefore we can say that the first and second level of knowledge management maturity levels represent normal performance [55].

When reaching level three and four, organization begins to integrate knowledge sharing and collaboration in its main operations and set resources for knowledge management. Employees in levels three and four use technology and standardized tools to capture, transfer, share and re-use of knowledge in the organization.

Finally, KMM at level five represent full integrated knowledge management operations and employees understand the role of knowledge sharing and cooperation in improving the performance for individuals and organization. Such behavior supports creative activities, leads to better competitive advantages and enhance the value chain to customers and suppliers [50, 56-57].

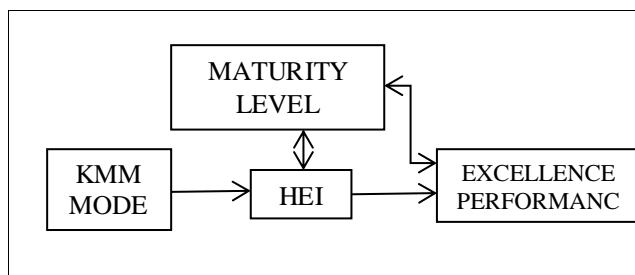


Figure 4. The conceptual framework

The relation between the model used in this study (See Figure 4) and high performance leads to the following main hypothesis in this study:

H1: There is a statistically significant effect for using the Asian knowledge model to measure intermediate colleges' high performance.

As the previous model suggest, leadership plays a critical role in the success of KM implementation. If there is a strong commitment at executive management level to change the organizational culture, then the organization will be able to create the values that lead to knowledge sharing [14, 58]. To achieve that, organization needs a leadership style able to manage organization elements to achieve the

best and maximum advantage of the existing knowledge in organization to improve performance. This leads to the following first sub-hypothesis in this study:

h1-1: There is a statistically significant effect for KM leadership on intermediate colleges high performance.

Operations are considered a complete knowledge inside organization. As value of chain reflects how far can organization add value in each production step to achieve organizational efficiency and increase performance [50, 59]. This leads to the following second sub-hypothesis in this study:

h1-2: There is a statistically significant effect for operations on intermediate colleges high performance.

Many KM research confirmed individual's impact on high performance. These authors [2, 14, 39, 50] explained that individual's motivations and method of interpretation, transfer and implementation of knowledge management processes influence greatly in determining the shape and nature of knowledge and how to manage it. Therefore, individual is the most powerful element of an effective knowledge management implementation. This leads to the following third sub-hypothesis in this study:

h1-3: There is a statistically significant effect for people on intermediate colleges high performance.

New technology plays a major role in performance improving by providing the right information at the right time and using them to rationalize decisions. Add to that technology needed to enhance sharing knowledge and learning inside organization. The integration between knowledge and organizational process enhance performance and competitive advantages [30, 50, 60]. This leads to the following fourth sub-hypothesis in this study:

h1-4: There is a statistically significant effect for technology on intermediate colleges high performance.

Knowledge process like generation, storage, distribution and implementation facilitates work within the organization. The presence of a specialist team captures knowledge and encourages workers to invest and participate in it. With the existence of an effective leadership leading those operations to bring harmony between them reduce the total cost of work and increase financial returns for organization. This leads to achieve creativity, innovation and high productivity [3, 37, 48, 61]. This leads to the following fifth sub-hypothesis in this study:

h1-5: There is a statistically significant effect for Knowledge process on intermediate colleges high performance.

Hila and Sangjae discussed learning and creativity in organization. Modern organizations characterized with continuous learning and applying the gained experience in their daily routine. Organizations seeking to recruit the experience gained from learning process in continuous performance development [12, 62]. This leads to the following sixth sub-hypothesis in this study:

h1-6: There is a statistically significant effect for learning and innovation on intermediate colleges high performance.

KM outcomes must reflex on effectiveness and efficiency inside the organization. This leads to high performance at individual level and organizational level [2,

3, 50]. This leads to the following seventh sub-hypothesis in this study:

h1-7: There is a statistically significant effect for KM outcomes on intermediate colleges high performance.

Other authors and KM experts added other variables and suggested new models which are more manifold. Those models included the pervious variables and variables like intellectual capital, agility, training and cultural capital [4, 7, 63].

H2: There are statistically significant differences for high performance related to the intermediate college.

3. Research Design

3.1. Study Population and Sampling

This study conducted at three intermediate colleges: Palestine Technical College (PTC), College of Applied Science (UCAS), College of Science and Technology (SCT). According to the model, the sample must be between 70%-80% from the population of the study [51]. The

population are 237 employees, the control sample 190. The usable sample was 167, which makes the response rate 87%).

3.4. Research Instrument

The first dimension referring to the model used in the study, is a prepared in advance questionnaire by the Asian productivity organization (KM assessment tool) as in Table 1. The second dimension of the instrument which measure high performance in intermediate colleges was developed by the current authors with the help of other research literature [14, 48-49, 61, 64-66]. Also Trustees validity has been conducted by a group of expert in KM and management field. Those statements were further revised and modified by the experts in a subsequent stage before drafting the final version of the questionnaire.

A five-point Likert scale of agreement was used for measurement, running from “Strongly Agree” to “Strongly Disagree”, with a neutral category for scale midpoint.

Table 1. Research instrument

Dimension 1: (Ind. V.) KM Assessment Tool	No. of statements	Dimension 2: (D.V.) High performance in HEI	No. of statements
Cat 1.0: KM Leadership	6		16
Cat 2.0: Processes	6		
Cat 3.0: People	6		
Cat 4.0: Technology	6		
Cat 5.0: Knowledge Processes	6		
Cat 6.0: Learning and Innovation	6		
Cat 7.0: KM Outcomes	6		

3.2. Validity and Reliability Assessment

The study adopted Cronbach’s α to measure the internal consistence reliability of the questionnaire. The results

showed that Cronbach’s α value for all dimensions were greater than 0.5. It indicated that the design of the questionnaire had a high internal consistency as shown in Table 2.

Table 2. Validity and reliability

Dimension	Reliability(Cronbach Alpha)	Validity ($\sqrt[3]{CA}$)	No. of Statements
KM Leadership	0.875	0.767	6
Processes	0.853	0.728	6
People	0.891	0.795	6
Technology	0.875	0.766	6
Knowledge Processes	0.747	0.559	6
Learning and Innovation	0.748	0.560	6
KM Outcomes	0.822	0.676	6
High performance	0.909	0.827	16
All Dimensions	0.894	0.818	58

3.3. Statistical Procedures

Several statistical tools were used for data analysis and hypotheses testing, including reliability correlation using Cronbach’s alpha, “ANOVA”, simple linear regression, OLS- ordinary least squares and step wise regression, LSD test for differences.

4. Data Analysis and Discussion of Results

Simple linear regression and “ANOVA” tests were used to test hypotheses. Simple linear regression used to test

whether there is an impact for one independent variable on a single dependent variable (High performance). The results are shown in Table 3.

The results of regression test indicate that sig. is less than 0.05 for all independent variables, which mean that there are significant statistically effect for independent variables on excellence performance.

Pearson coefficient and regression coefficient sign for all independent variables was positive. This result means whenever the value of independent variables increase, there will be increase in performance.

Changes in the independent variable is responsible for the interpretation of a rate r^2 of all the changes that occur in performance, and there is a rate $100-r^2$ due to other factors specific to the other independent variables and other factors not mentioned in the model, in addition to the random error.

The table reveals that the findings of significance level are less than 0.05, which means that we can rely on the previous model and circulating the sample results on research community.

Therefore, the results of the analysis proved the existence of a relationship between the independent variable (KM assessment tool) with its 7 sub-dimensions and the dependent variable (high performance).

Each dimension in the independent variable has an effect individually on the dependent variable. According to that, we accept hypothesis H1 and it is sub-hypotheses.

Table 3. Simple Linear Regression and “ANOVA”

Variable	Sig.	Decision at $\alpha = 0.05$	Regression coefficient	Pearson coefficient r	Sign	R2	H1
KM Leadership	0.0	Significant	0.245	0.444	+	19.7%	✓
Processes	0.0	Significant	0.253	0.453	+	20.6%	✓
People	0.0	Significant	0.172	0.315	+	9.9%	✓
Technology	0.001	Significant	0.188	0.192	+	3.7%	✓
Knowledge Processes	0.017	Significant	0.112	0.143	+	2%	✓
Learning and Innovation	0.0	Significant	0.187	0.232	+	5.4%	✓
KM Outcomes	0.0	Significant	0.222	0.307	+	9.4%	✓

Step wise regression conducted to arrange the effect of each variable in KMM model on the dependent variable and excluding of other insignificant variables. Table 4 shows that four variables were effecting significantly (Processes, KM leadership, People, KM Outcomes,) and three were not

effecting (Learning and Innovation, Technology, Learning and Innovation). The explanation for that is the effect for the four variables were very strong on high performance more than (Knowledge Processes, Learning and Innovation, Technology) from the point of view of the sample.

Table 4. Step Wise R

Rank	Variable	T	Sig.	Decision at $\alpha = 0.05$
1	Processes	3.5	0.001	significant
2	KM Leadership	2.88	0.004	significant
3	People	2.47	0.014	significant
4	KM Outcomes	2.24	0.025	significant
5	Knowledge Processes	1.83	0.068	insignificant
6	Learning and Innovation	0.705	0.48	insignificant
7	Technology	0.27	0.78	insignificant

According to the model, radar chart had been done by calculating the response of each paragraph in sub-domains rates as shown in Table 5. The total score was 118.7348 which mean that KMM is in level tow (initiation). Intermediate colleges begin to realize the need for knowledge management or have already begun in a pilot project for knowledge management. In that level of maturity, intermediate colleges must expand KM

implementation to reach for level three. Also from Table 4 we find that dimensions 5- 7 need to be improved.

For the second hypothesis H2, LSD test conducted, and the results showed that there are differences in high performance for college (PTC) with mean diff. 0.14578 and there are differences in high performance for college (UCAS) with mean diff. 0.14578 as shown in Table 6.

Table 5. Radar Chart

No.	Sub-Domain	Palestine Technical College (5-30)	College of Applied Science (5-30)	College of Science and Technology (5-30)	Total
1	Leadership	20.08138	19.65659	20.00862	19.91553
2	Processes	18.5036	17.61538	17.67816	17.93238
3	People	18.01079	17.30769	16.89655	17.76811
4	Technology	17.57914	17.46154	16.48276	17.17448
5	Knowledge Processes	16.33453	16.24176	15.54023	16.03884
6	Learning and Innovation	15.8777	15.51648	14.90805	15.43407
7	KM Outcomes	14.80576	14.51648	14.09195	14.47139
Total (42-210)		121.19	118.3159	115.6063	118.7348

Table 6. LSD TEST

(I) coll.	(J) coll.	Mean diff.(I-J)	$\alpha = 0.05$	Decision at $\alpha = 0.05$
PTC	UCAS	0.14578	0.004	significant
	SCT	0.0871	0.087	insignificant
UCAS	PTC	0.14578	0.004	significant
	SCT	0.05867	0.259	insignificant

5. Conclusions

The concept of KM implementation is already known in Palestinian intermediate colleges. Many studies conducted on KM. The originality of study comes from being discussing KMM using a solid model. The overall findings of the current study suggest that KMM lead to high performance. KMM assessment shows that the intermediate colleges' maturity level is in the second level where the organization begins to realize the need for knowledge management or has already begun in a pilot project for knowledge management where knowledge sharing and collaboration is common.

Findings also support the main hypothesis and it is sub-hypotheses. The most important factors effecting high performance are: Processes, KM leadership, People, KM Outcomes.

Others factors (Technology, learning and innovation, knowledge process) effecting also on high performance but cause of other factors are stronger and there are random faults the effect was insignificant in step wise regression.

Intermediate colleges need to invest more in those dimensions to enhance their effect on performance.

Also we can find that KMM for intermediate colleges is at the second level, therefore, more concentrating on KM factors is needed.

As those institutions' knowledge provider, they need to concentrate on knowledge process such as sharing, research, training, etc. Knowledge outcomes need to be more updated and renewed continually. Also technology infrastructure must be enabled all over the organization with proper facilities.

Adding to that, more support for learning and innovation process (financial, HR, resources, R & D, etc) as a strategic competitive advantage.

Authors suggest conducting another survey at West Bank, so the use of this instrument could be generalized for other intermediate colleges.

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