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The Impact of Knowledge Management by Technological Tools and Electronic-means on Academic Staff Performance in Palestinian Universities

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ABSTRACT

This study aims to establish how the management of knowledge through technological and electronic means, impacts the performance of staff within Palestinian universities. Specifically, the study focusses on the West Bank area of Palestine, where 11 universities are located. A total of around 3000 individuals are employed by these universities, and of these, a total of 282 responded to the survey that was used to collect data. Analysis of this data has revealed a positive relationship between the independent and dependent variables that apply. This pattern suggests that the availability of technological and electronic devices does positively affect how staff within universities perform. The study discusses the implications of this and concludes that investment in tools would aid progress within the universities that were considered.

Keywords: Knowledge-management, Technological-tools and Electronic-means, Academic Staff-performance

JEL Classifications: M10, M19, I23

1. INTRODUCTION

Institutions of higher education are vitally important within any country. Education affects the holistic growth and development of academic students within a country, yet higher education is the final stage of teaching a young person receives before embarking on a career. The knowledge and experience acquired by a student within an educational establishment has a pivotal impact upon his or her career (Eleni, 2003); thus, it follows that the staff within any university have a duty to deliver a high quality of mentoring and instruction, to optimize the learning environment that nurtures the students. One of the most important roles of a university is the purveyance of knowledge. It therefore stands to reason that within a given establishment, the staff's methods of managing knowledge are integral to how well they perform (Monsted, 2006). Increasingly, as technology advances, it comes to play a part in how

knowledge is acquired and disseminated. There is an expectation that increased investment in up to date technological and electronic devices could improve how staff manage the knowledge they impart, and thus their overall performance. This study will seek to validate such a hypothesis with quantifiable evidence; it will then look at the implications of knowledge management through technology being demonstrably critical.

For the purposes of this study, Knowledge Management (KM), should be understood as the process by which knowledge and information are obtained, stored, shared, and used to make informed decisions (Sireteanu and Bedrule-Grigoruta, 2007). Knowledge management is a form of active learning, and can entail creation, analysis, storage, and the conveyance of information in such a way as to improve decision making and pave the way for future learning (Chawla and Joshi, 2011).

To understand why knowledge management (KM) takes on a unique importance when applied to the context of a university. A university is a learning institution, which means its primary currencies are knowledge, wisdom and information. With this in mind, activities that take place within a university threshold include learning, teaching, research and experimentation. Collectively, for these to be readily achievable, an environment that promotes the wellbeing of staff and students alike becomes a prerequisite (Mikulecká and Mikulecký, 2000). If such an environment is to be created, then regulation and management must come into play, thus knowledge and all practices centered around its acquisition must be coherently managed. Students at a university may attend lectures and tutorials, where they interact with the staff and are able to benefit from knowledge and experience those staff already possess. With these raw materials, students then have to make something more refined, and this is usually achieved by carrying out independent research. This research is yet another aspect of knowledge acquisition that requires managing, to increase its effectiveness. A fundamental aspect of this is the interchange of information between a university's departments (Sarmadi et al., 2017).

This study will explore one particular aspect of how such knowledge is managed; namely, through technological and electronic devices, including computers, tablets, iPads, mobile phones and internet servers. Such devices are significant because they make knowledge and information accessible at the tap of a button, or the typing of a command. It is little wonder that the internet is now recognized as one of the most important tools in the management of knowledge (Trivellaa and Dimitrios, 2015). It is similarly to be expected that there is some recognition worldwide that information technology and modern communication networks render us a human community, or a global village (Bataineh, 2017). Because information and communication technology is proliferating, this study identifies its importance and hones in particularly on how it has influenced the performance of academic staff within Palestine's universities. It also examines the potential implications of Palestinian academic trends for the future of knowledge management.

In Palestine, education falls under the jurisdiction of the Palestinian Ministry of Education and Higher Learning. By comparison with regional and global standards, rates of enrolment in the country are reasonably high. A 2003 survey (UNDP, 2015) indicated that 60% of young people aged 10 – 24 prioritized education above other values and measures of success in their lives. By 2007, the enrolment rate within universities reached 46.2% (UNDP, 2015). Within Palestine's universities, there has been widespread recognition of the importance of information and communication devices within knowledge management. This has resulted in much investment in technology, yet public institutions in Palestine, particularly centers for higher education, are confronted with staff who take hours to perform tasks. Queues and administrative delays are consequences of this, and they create environments where it is difficult for employees and students to efficiently perform tasks (EU Commission, 2016). Much recent literature concerning in Arab country education sector has focused upon quantifiable indicators of successful Knowledge Management, for

example, equity, and student: Teacher ratios. Often, these studies omit discussions of the quality of education in terms of processes for knowledge acquisition, and how effective these are for both students and academic staff (Al Shobaki et al., 2016).

This paper will seek to redress that balance. Education in Palestine is a unique subject and a unique issue, because Palestine is one of the countries in the world where development and progress are taking place, despite the daily challenges posed by external forces such as the country's ongoing conflict with Israel.

2. THEORETICAL BACKGROUND

According to Koenig and Srikantaiah (2000), KM is the practice of creating, replicating information data that is known to be of importance (rich, deep and open communication) within a form and the entire world. This practice involves the creation, acquisition, sharing, organizing, and implementation of information. It can also be seen as the systematic management of an institution's knowledge wealth or asset with the sole intention of value creation and meeting requirements tactically and strategically. The process involves initiatives, strategies, systems as well as methods that enhance the creation, refinement, storage, and assessment of the knowledge asset. Knowledge management is therefore merely getting the right knowledge assets to the intended party promptly.

Acquisition knowledge is the process of obtaining knowledge from external sources like external experts, competitors, partners, customers, and suppliers. It is vital for a organization to view the value chain to appreciate the importance of external knowledge (Gamble and Blackwell 2001), while organization of knowledge is the practice of mapping or indexing knowledge into given categories for storage, retrieval or navigation (Botha et al., 2008). As Chou (2005) the storage of knowledge represents the safekeeping of Organizational knowledge. It can take the forms of an electronic database, physically written documentation, and codified human expertise in expert systems among others.

According to Nonaka's SECI model, (1994) Knowledge creation is the endless process of transfer, the combination as well as the conversion of the various types of knowledge. The process is made possible through the practice, collaboration, interaction and education of the users. Brown and Woodland (1999) a more competitive organization is able to create useful knowledge. While Mills and Smith (2011) Clarify Application of knowledge is the backbone of the knowledge management process. It involves actual use of knowledge effectively in the products, services, production processes, training and motivating the workforce to employ creativity in production and most importantly making user of the workers understanding of the products, services, and company processes. In simple terms application of knowledge is a means of making knowledge more active and relevant for the organization in value creation. Technology tools and electronic means can improve Knowledge management process through a combination of hardware and software (Lucca et al., 2000; Tsui, 2002b).

Most learning institutions have invested heavily in the computerization process (Al-Shobaki et al., 2018). This process

includes the utilization of computers, mobile phones, servers, and the internet in conducting daily tasks in the universities. These modern practices are termed to be of more advantageous as compared to traditional methods, as they are cheaper, faster, and more secure when it comes to KM (Al Mudallal et al., 2016). According to Abu-Naser et al. (2016), introduction and adoption of KM by universities contribute positively to the future dynamics of the learning environment, development, and improvement of the efficiency activities of knowledge sharing and improve the overall performance of institutions. The need for consciously managing knowledge in an organization setting is now recognized as an essential issue to enhance innovation, business performance, and client satisfaction (Al Mudallal et al., 2016).

2.1. Academic Staff Performance

Academic staff performance can be assessed fundamentally in terms of higher education quality assurance. Many factors relating to staff performance are how rapidly the employees are able to respond to students' requirements, and the frequency with which those requirements are met. Employees' opinions about what constitutes good performance is very consistent. Besides the availability of electronic devices and technological tools, other factors contributing to staff's ability to perform successfully, include their experience, and the availability of library resources (Madi, 2010).

Performance of an organization is measured by its ability to create value. Better performance can be identified through the following indicators; steady Innovations and Growth, Operational excellence, possession of competitive advantages by the organization, and steady value creation. As Terziovski et al. (1999) Technological application, Organizational culture and structure, financial performance and most fundamentally, knowledge management are considered critical for an organization good performance.

Administrative difficulties caused by poor management of knowledge results in long waiting hours for staff to complete their tasks. In many Palestine universities and colleges, it is a norm for students to stand on long queues to receive services (EU-Commission, 2016). Lack of proper knowledge management plan makes it hard for employees in these institutions to perform their tasks.

Building upon the findings of the theoretical and empirical arguments of previous studies, there are links between knowledge management by technological tools and electronic-means and academic staff performance. Thus, to explain the impact of knowledge management by technological tools and electronic-means on academic staff performance, this study hypothesize the following:

- H₁: Knowledge management by technological tools and electronic-means play a significant role in Palestine Universities.
- H₂: Academic staff performance plays a significant role in Palestine Universities.
- H₃: There is a relationship between knowledge management by technological tools and electronic-means and academic staff performance in Palestine Universities.
- H₄: There is impact of knowledge management by technological tools and electronic-means on academic staff performance in Palestine Universities.

3. METHODOLOGY

3.1. Population and Sample Size

The research population consisted of all the staff (3662) from nine Palestine University located in West Bank region. The sample size was determined using population to size sampling methodology (Kothari, 2004).

$$n = \frac{z^2 \times p \times q \times N}{\epsilon^2 (N - 1) + z^2 \times p \times q} \quad (1)$$

Where,

n = sample size

z = the figure of the desired confidence level at 95% (value obtained from the table is 1.96)

p = sample proportion (0.5)

q = 1-p (0.5)

N = size of the population of interest (3662 academic staff distributed on nine universities in West-Bank)

ε = precision rate or acceptable error (5.6%)

n = required sample size.

$$n = \frac{1.96^2 \times 0.5 \times 0.5 \times 3662}{0.056^2 (3662 - 1) + 1.96^2 \times 0.5 \times 0.5}$$

Sample size (n) = 282 Observations

3.2. Conceptual Model

The conceptual model of this study as shown in Figure 1 consists different types of variables. The independent variables were the implementation of KM (creation, acquisition, sharing, organizing, and application) and the dependent variable was university academic staff performance.

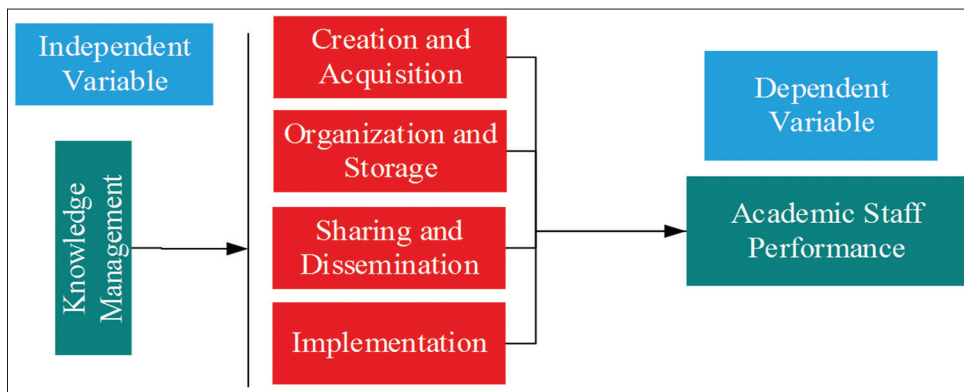
3.3. Measurement Scales

Structured questionnaires were developed by researchers and used in collecting data from the (282) academic staffs. The questioner consists of two parts; the first part captured knowledge management by technological tools and electronic means, while the second part focused on academic staff performance. The research questionnaire was administered with a five Likert scale from (5= strongly agree to 1= strongly disagree). Based on previous studies, scholar measures the dependent and independent variables in conceptual model. Implementation of Knowledge Management by Technological Tools and Electronic-means was measured using (24) items scale distributed in four domains: Creation and acquisition, organization and storage, sharing & dissemination and implementation), Also academic staff performance was measured using (22) items scale.

3.3.1. Test for reliability

Cronbach's alpha test method was used to check for internal consistency within the data set as shown in Table 1. According to the results, there is a reasonable range of Cronbach's alpha coefficient across the four domains of KM which ranges between (0.0 and + 1.0) indicating that there is a higher degree of internal consistency in the data, Cronbach's alpha value for the (24) items is (0.908), while the Cronbach's alpha value for the (22) items of academic staff performance is (0.944), suggesting that all the

Figure 1: Conceptual model of study



Source: (Authors)

questions have relatively high internal consistency. This finding indicates an excellent validity and reliability of the dataset.

3.3.2. Test for normality

Test for normality for each dimension the study used a Kolmogorov-Smirnov test (K-S) to test the normalcy in the data set as shown in Table 2. The results show that there is a normal distribution in the dataset as the P-values for each domain is higher than the significance level at 5%. The dataset is suitable for carrying out further analysis.

3.4. Research Method

In order to examine research hypotheses, this study employs one sample (t-test) to understand the role of knowledge management by technological tools and electronic-means, and role of Academic staff performance in Palestine Universities, in addition Pearson correlation test to understand the relationship between dependent, independent, in the conceptual model. And uses multi-linear regression to test the impact of knowledge management by technological tools and electronic means on academic staff performance.

4. RESEARCH FINDINGS AND DISCUSSION

4.1. Testing Hypothesis

H₁: Knowledge management by technological tools and electronic-means play a significant role in Palestine Universities.

In order to test this hypothesis, one-sample t test was used with (test value = 3) as shown in Table 2.

As shown in the Table 3, the implementation of KM by technological tools and electronic-means (creation and acquisition, organization and storage, sharing and dissemination, implementation and dissemination) positively. Since the value of calculated (t) was greater than the value of the critical (t) which is equal to (1.96) at the significance level ($\alpha \leq 0.05$).

H₂: Academic staff performance plays a significant role in Palestine Universities.

In order to test this hypothesis, one-sample t test was used with (test value = 3) as shown in Table 3.

Table 1: Cronbach’s alpha test

Domain	Number of items	Cronbach’s alpha
Knowledge creation and acquisition	6	0.790
Knowledge organization and storage	6	0.869
Knowledge sharing and dissemination	6	0.785
Knowledge implementation and dissemination	6	0.755
All domains of knowledge management	24	0.908
Academic staff performance	22	0.944

Table 2: Kolmogorov-Smirnov test (K-S) for normality

Domain	P-value/Sig.
Knowledge creation and acquisition	0.236
Knowledge organization and storage	0.442
Knowledge sharing and dissemination	0.431
Knowledge implementation and dissemination	0.382
All the domains of knowledge management	0.531
Academic staff performance	0.427

As shown in the Table 4, the academic staff performance in Palestine Universities Positively. Since the value of calculated (t) was greater than the value of the critical (t) which is equal to (1.96) at the significance level ($\alpha \leq 0.05$).

H₃: There is a correlations between knowledge management by technological tools and electronic-means and academic staff performance in Palestine Universities.

In order to test this hypothesis, a Pearson correlation was made between knowledge management by technological tools and electronic-means and academic staff performance in Palestine Universities. As shown Table 5.

As shown in Table 5, the results show that all the domains had a positive and significant relationship with staff performance.

H₄: There is impact of knowledge management by technological tools and electronic-means on academic staff performance in Palestine Universities.

In order to test this Hypothesis, multiple Regression analysis was used, but before start applying regression analysis, the researchers conducted some tests, in order to ensure the suitability of data for regression analysis assumptions, as the following: Assuming that

Table 3: The result of one-sample t test knowledge management by technological tools and electronic-means implementation in Palestine Universities

Dimensions	Mean±SD	D.F	T-value	Significant
Knowledge creation and acquisition	3.2045±0.60994	281	5.630	0.000
Knowledge organization and storage	3.1194±0.63611	281	3.152	0.002
Knowledge sharing and dissemination	3.3274±0.52079	281	10.558	0.000
Knowledge implementation and dissemination	3.1726±0.46076	281	6.290	0.000
All the domains of knowledge management	3.2060±0.45906	281	7.535	0.000

SD: Standard deviation

Table 4: The result of one-sample t test academic staff performance in Palestine Universities

Dimension	Mean±SD	D.F	T-value	Significant
Academic staff performance	3.4439±0.39504	281	18.87	0.00

SD: Standard deviation

there is no high correlation between the independent variables (multi-collinearity), the researchers used the variance inflation factor (VIF) and (tolerance) test for each independent variable, as shown in Table 6.

As shown in Table 6 the (VIF) values for all dimensions are <10, ranging between (1.376 and 2.798). Tolerance values ranged between (0.357 and 0.726) which is >0.05. It indicates that there is no high correlation between the independent variables which can lead to misleading results for regression analysis.

As in Table 7 beta and t-test values show that knowledge management by technological tools and electronic-means (creation and acquisition, organization and storage, sharing and dissemination, implementation and dissemination) have statistically significant impact on academic staff performance at Palestinian Universities, since $P < 0.05$, According to adjust $R^2 = 0.565$ indicates that the independent variables jointly explain 56% variation in the dependent variable (academic staff performance).

Therefore, the p-values of domains; creation and acquisition, organization and storage, sharing and dissemination, implementation and dissemination ($P = 0.05$, $P = 0.00$, $P = 0.04$, $P = 0.00$) respectively, had a significant and positive impact on the performance of academic staffs. This result indicates that the use of technological and electronic means in creation and acquisition knowledge within a university leads to a general improvement in academic staff performance. Knowledge creation involves the utilization of internal and external resources of an organization to generate new knowledge for achieving the organizational goals, with digital means it is easier for the staffs and managers to manage this process and meet the intended targets. Moodysson (2008) noted that use of this technological and electronic means helps in brainstorming and conducting research so that to better the general performance of an organization. The availability of computerized and electronic means as made it easier for top managers and staffs to efficiently conduct research both online and use of other platforms with the aim of improving their general performance (Calantone and Li, 2008; Pinto, 2012).

While knowledge organization and storage indicate that use of both technological and electronic means has enabled academic teams to organize and retrieve their stored information quickly/easily, an act that improves their general performance. These results are in line with those of Hadi et al. (2006), where the use of digital (technological and electron means) to store information in a mobile industry lead to improvement in its performance when measured regarding revenue.

But Knowledge sharing and dissemination can be attributed to the advantage that technological and electronic means has when it comes to communication within the universities; as current technologies have made information sharing to be done very fast and accurately with just a tap of a button for example through the use of emails, Skype, telephone among many other digital forms of communication. Bhatt (2001) noted that introduction and adoption of digital ways of discussion and sharing of information have led to the increased performance and general profitability of many business sectors all over the world, as most of the channels used like email are cheaper as compared to the traditional mean like the use of posters to send letters.

Whereas Knowledge implementation suggest that proper use of existing knowledge for decision making as a positive effect on the general staff performance, as it makes it easier for the organization to achieve the intended goals. According to the study done by Chong and Choi (2005), proper utilization of available information to make a decision leads good understanding of issue between the managers and general staffs, hence, resulting to a well-informed decision that leads to the proper performance of the organization. Besides, the use of technological and electronic means it easier to arrange and analyze information (Boulding et al., 2005; Spender, 2009).

5. CONCLUSION AND RECOMMENDATIONS

The performance of employees is one of the most common variables with an impact of the independent variables on it in the administrative sciences because it plays a vital role in the performance of organizations (Al-Shobaki et al., 2018). In an era where large quantities of data must be processed and information produced in the shortest time possible, the work of university academic staff would be tough without the implementation of proper KM, and this was explicit from the findings. All elements under independent variables appeared to have a positive effect on the performance of the academic staff. The accumulation of individual impact totaled in the conclusion that knowledge management by technological tools and electronic means can significantly improve university academic

Table 5: Pearson correlations between knowledge management by technological tools and electronic-means and academic staff performance

Variable	Pearson correlation	Significant (2-tailed)
Creation and acquisition	0.587**	0.000
Knowledge organization and storage	0.719**	0.000
Knowledge sharing and dissemination	0.615**	0.000
Knowledge implementation and dissemination	0.453**	0.000
All domains knowledge management	0.732**	0.000

Table 6: Variance inflation factor

Variable	Tolerance	VIF
Knowledge creation and acquisition	0.409	2.443
Knowledge organization and storage	0.516	1.936
Knowledge sharing and dissemination	0.357	2.798
Knowledge implementation and dissemination	0.726	1.376

Table 7: Multiple regression results on the impact of knowledge management by on academic staff performance at Palestinian Universities

Variable	B	t	Beta	Significant
Knowledge creation and acquisition	0.077	1.945	0.120	0.050
Knowledge organization and storage	0.313	9.209	0.504	0.000
Knowledge sharing and dissemination	0.101	2.017	0.133	0.045
Knowledge implementation	0.107	2.710	0.125	0.007
R ²	0.571			
Adjusted R ²	0.565			
F	92.242			
Significant	0.000			

Dependent variable: Academic staff performance

staff performance thus supporting our hypothesis. The data did not have a particular idea of the overall attitude of the staff towards the introduction of knowledge management tool. Consequently, all the sub-hypotheses were confirmed as predicted: Each would have a positive impact on the performance of the staff.

Therefore, Palestinian Universities stand a great chance of recording improved performance from the team prioritizing KM. It is on this basis the Palestinian universities should continue investing in electronic means and technological tools for knowledge management because it will boost the performance of the staff and help employees collect, store, visualize and share information. These tools help employees to be efficient in their task thus saving time, money, and other resources that could otherwise be wasted. And thus, the overall education quality of the country.

The Palestinian universities should also consider carrying out independent studies to determine how each institution can independently benefit from knowledge management. For future research, the universities are obliged to consider using other variables, that may affect staff academic performance.

6. LIMITATIONS

Although the findings of the study supported the hypothesis thus leading to the conclusion that KM through electronic means and technological tools had a positive impact on the performance of the university academic staff, one of the significant limitations was to determine the attitude of employees had towards these tools. It

was not possible to decide whether or not they felt threatened by technology perhaps because of the way the questionnaires were set up. For future research, this should be included in the survey and accounted for at the end of the study.

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