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INVESTIGATING THE CORRELATION BETWEEN KNOWLEDGE MANAGEMENT AND INNOVATION AT DEPARTMENTS OF EDUCATION IN TEHRAN

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ABSTRACT

The main aim of this research is to investigate the correlation between the knowledge management and innovation at departments of education in Tehran City. The statistical population consists of all staff at departments of education in Tehran City. 318 out of 2500 employees at 19 districts of departments of education in Tehran during 2012-13 is selected as the samples by simple random sampling through Morgan Table. The measurement tool consists of two knowledge management and innovation questionnaires which are conducted on employees. The reliability of questionnaire is measured by Cronbach's alpha coefficient and their coefficients are equal to 0.94 for knowledge management and 0.88 for innovation. Data is analyzed at both descriptive and inferential levels and the results of data analysis indicate that 1- There is a positive and significant correlation between the knowledge management and innovation; 2- There is a positive and significant correlation between all aspects of knowledge management and innovation in staff.

Keywords: *Innovation, Knowledge Management, Education*

INTRODUCTION

Like other organizations of the world, the local educational organizations are now forced to compete with other local and foreign organizations in order to be pioneer in scientific areas. This research assumes that the knowledge management is one of the non-negligible ways to achieve the innovation. In other words, any organization which fails to create the knowledge and cannot organize and manage the existing knowledge for operation in present and future, cannot expect the innovative because such this organization is not only able to utilize its knowledge, but also it successively reworks and loses its attention and energy (Fuller, 2001). The knowledge management is the way of identifying, utilizing, organizing and processing the information for knowledge creation which is distributed after it and then becomes available to others to be utilized for further knowledge creation (Radding, 2004). The innovation occurs when the idea becomes as the product, process or service. Cardinal *et al.*, (2001) have indicated that the innovative procedure includes the technical and physical and knowledge-based activities which are necessary for generation of new products.

Therefore, there is a direct correlation between the knowledge management performance and innovation, so that the more the knowledge management performance become strong, the more it has positive impact on the increased innovation (TalebiKouhestani and Mohammadreza, 2007). The education systems can play the roles in establishing the knowledge management because the education will be able to train the knowledgeable people through the knowledge management processes since there is a close relationship between the learning and knowledge creation methods, and thus they will be able to identify and share and accurately define their needs in terms of information. Therefore, this study explains the knowledge management as well as its correlation with innovation and information technology and their roles in improving the efficiency of processes at departments of education.

MATERIALS AND METHODS

This research has descriptive-correlative method. The statistical population consists of all staff at departments of education in Tehran City. 318 out of 2500 employees at 19 districts of departments of

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education in Tehran during 2012-13 are selected as the samples by simple random sampling through Morgan Table. The measurement tool consists of two knowledge management and innovation questionnaires which are conducted on employees. The reliability of questionnaire is measured by Cronbach's alpha coefficient and their coefficients are equal to 0.94 for knowledge management and 0.88 for innovation. Data analysis for investigating the accuracy of research questions is significantly important. The raw data is analyzed through SPSS software and the descriptive and inferential statistics are utilized in this regard. Furthermore, the Kolmogorov-Smirnov test is utilized to determine the normalization or non-normalization of data.

RESULTS AND DISCUSSION

Results

1. Data Analysis for Main Research Question

Main question: Is there a correlation between the knowledge management and staff innovation at departments of education in Tehran City?

Table 1: Summary of regression results about the correlation between the knowledge management and staff innovation at departments of education

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.812	0.660	0.659	5.400

The results of Table 1 indicate that the multiple correlation coefficient is equal to R=0.81 and the coefficient of determination equal to R Square= 0.66 and the adjusted coefficient of determination equal to 0.65 (p=0.05 and F= 613.777). Therefore, the coefficient of determination indicates that the knowledge management variable generally explains about 66% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

Table 2: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	-1.525	1.382		-1.104	0.270
Knowledge management	0.294	0.012	0.812	24.775	0.00

As shown in Table (2), the multiple-correlation between the knowledge management and innovation indicates that the knowledge management is able to explain the dependent variable with beta of 0.81. In other words, one unit increased standard deviation in knowledge management will lead to 0.81 of increased standard deviation in innovation.

According to the coefficients of Table (2), the regression line equation is as follows:

Innovation= -1.525 + (0.294) knowledge management

2. Data Analysis for Sub Questions of Research

First sub-question: Is there a correlation between the leadership and management in organization and staff innovation at departments of education in Tehran City?

Table 3: Summary of regression results about the correlation between the leadership and management in organization and staff innovation at departments of education in Tehran City

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.531	0.282	0.280	7.847

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The results of Table (3) indicate that the multiple correlation coefficient is equal to $R=0.53$ and the coefficient of determination equal to $R\text{ Square}= 0.28$ and the adjusted coefficient of determination equal to 0.28 ($p=0.05$ and $F= 124.344$). Therefore, the coefficient of determination indicates that the knowledge management variable generally explains about 28% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

Table 4: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	9.855	2.020		4.893	0.00
Leadership and management in organization	1.305	0.117	0.531	11.151	0.00

As shown in Table (4), the multiple-correlation between the leadership and management in organization with innovation indicates that the management in organization is able to explain the dependent variable with beta of 0.53. In other words, one unit increased standard deviation in leadership and management in organization will lead to 0.53 of increased standard deviation in innovation.

According to the coefficients of Table (4), the regression line equation is as follows:

$$\text{Innovation} = 9.855 + (1.305) \text{ leadership and management in organization}$$

Second sub-question: Is there a correlation between the teamwork in the organization and staff innovation at departments of education in Tehran City?

Table 5: Summary of regression results about the correlation between the teamwork in the organization and staff innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.651	0.424	0.422	7.033

The results of Table (5) indicate that the multiple correlation coefficient is equal to $R=0.65$ and the coefficient of determination equal to $R\text{ Square}= 0.42$ and the adjusted coefficient of determination equal to 0.42 ($p=0.05$ and $F= 232.155$).

Therefore, the coefficient of determination indicates that the teamwork generally explains about 42% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

Table 6: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	9.385	1.528		6.144	0.00
Teamwork in the organization	2.047	0.134	0.651	15.237	0.00

As shown in Table (6), the multiple-correlation between the teamwork and innovation indicates that the teamwork is able to explain the dependent variable with beta of 0.65.

In other words, one unit increased standard deviation in teamwork will lead to 0.65 of increased standard deviation in innovation.

According to the coefficients of Table (6), the regression line equation is as follows:

$$\text{Innovation} = 9.385 + (2.047) \text{ Teamwork in the organization}$$

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Third sub-question: Is there a correlation between the knowledge sharing and staff innovation at departments of education in Tehran City?

Table 7: Summary of regression results about the correlation between the knowledge sharing and staff innovation at departments of education

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.491	0.241	0.239	8.069

The results of Table (7) indicate that the multiple correlation coefficient is equal to $R=0.49$ and the coefficient of determination equal to $R^2=0.24$ and the adjusted coefficient of determination equal to 0.23 ($p=0.05$ and $F=100.494$). Therefore, the coefficient of determination indicates that the knowledge sharing generally explains about 24% of variance in staff innovation as the dependent variable.

Table 8: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	17.802	1.475		12.073	0.00
Knowledge sharing	1.699	0.169	0.491	10.025	0.00

As shown in Table (8), the multiple-correlation between the knowledge sharing and innovation indicates that the knowledge sharing is able to explain the dependent variable with beta of 0.49. In other words, one unit increased standard deviation in knowledge sharing will lead to 0.49 of increased standard deviation in innovation.

According to the coefficients of Table (8), the regression line equation is as follows:

$$\text{Innovation} = 17.802 + (1.699) \text{ knowledge sharing}$$

Fourth sub-question: Is there a correlation between the knowledge creation and staff innovation at departments of education in Tehran City?

Table 9: Summary of regression results about the correlation between the knowledge creation and innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.524	0.275	0.272	7.890

The results of Table (9) indicate that the multiple correlation coefficient is equal to $R=0.52$ and the coefficient of determination equal to $R^2=0.27$ and the adjusted coefficient of determination equal to 0.27 ($p=0.05$ and $F=119.568$). Therefore, the coefficient of determination indicates that the knowledge creation variable generally explains about 27% of variance in staff innovation as the dependent variable.

Table 10: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	18.442	1.305		14.128	0.00
Knowledge creation	1.630	0.149	0.524	10.935	0.00

As shown in Table (10), the multiple-correlation between the knowledge creation and innovation indicates that the knowledge creation is able to explain the dependent variable with beta of 0.52. In other

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words, one unit increased standard deviation in knowledge creation will lead to 0.52 of increased standard deviation in innovation.

According to the coefficients of Table (10), the regression line equation is as follows:

$$\text{Innovation} = 18.442 + (1.630) \text{ knowledge creation}$$

Fifth sub-question: Is there a correlation between the digital justice and staff innovation at departments of education in Tehran City?

Table 11: Summary of regression results about the correlation between the digital justice and staff innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.600	0.360	0.358	7.410

The results of Table (11) indicate that the multiple correlation coefficient is equal to $R=0.60$ and the coefficient of determination equal to $R^2=0.36$ and the adjusted coefficient of determination equal to 0.35 ($p=0.05$ and $F=177.839$). Therefore, the coefficient of determination indicates that the digital justice variable generally explains about 36% of variance in staff innovation as the dependent variable.

Table 12: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	6.384	1.956		3.264	0.01
Digital justice	2.422	0.182	0.600	13.336	0.00

As shown in Table (12), the multiple-correlation between the digital justice and innovation indicates that the digital justice is able to explain the dependent variable with beta of 0.60. In other words, one unit increased standard deviation in digital justice will lead to 0.60 of increased standard deviation in innovation.

According to the coefficients of Table (12), the regression line equation is as follows:

$$\text{Innovation} = 6.384 + (2.422) \text{ digital justice}$$

Sixth sub-question: Is there a correlation between the ideas and mission with staff innovation at departments of education in Tehran City?

Table 13: Summary of regression results about the correlation between the ideas and mission with staff innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.545	0.298	0.295	7.764

The results of Table (13) indicate that the multiple correlation coefficient is equal to $R=0.54$ and the coefficient of determination equal to $R^2=0.29$ and the adjusted coefficient of determination equal to 0.29 ($p=0.05$ and $F=133.825$).

Table 14: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	17.009	1.357		12.538	0.00
Ideas and mission	1.851	0.160	0.545	11.568	0.00

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Therefore, the coefficient of determination indicates that the ideas and mission generally explain about 29% of variance in staff innovation as the dependent variable at departments of education in Tehran City. As shown in Table (14), the multiple-correlation between the ideas and mission with innovation indicates that the ideas and mission are able to explain the dependent variable with beta of 0.54. In other words, one unit increased standard deviation in ideas and mission will lead to 0.54 of increased standard deviation in innovation.

According to the coefficients of Table (14), the regression line equation is as follows:

$$\text{Innovation} = 17.009 + (1.851) \text{ ideas and mission}$$

Seventh sub-question: Is there a correlation between the knowledge strategy and staff innovation at departments of education in Tehran City?

Table 15: Summary of regression results about the correlation between the knowledge strategy and staff innovation

Multiple correlation coefficient	Coefficient of determination	of Adjusted coefficient of determination	Standard error of approximation
0.685	0.470	0.468	6.747

The results of Table 15 indicate that the multiple correlation coefficient is equal to $R=0.68$ and the coefficient of determination equal to $R^2= 0.47$ and the adjusted coefficient of determination equal to 0.46 ($p=0.05$ and $F= 279.690$). Therefore, the coefficient of determination indicates that the knowledge strategy variable generally explains about 47% of variance in staff innovation as the dependent variable.

Table 16: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	8.772	1.432		6.125	0.00
Knowledge strategy	2.176	0.130	0.685	16.724	0.00

As shown in Table (16), the multiple-correlation between the knowledge strategy and innovation indicates that the knowledge strategy is able to explain the dependent variable with beta of 0.68. In other words, one unit increased standard deviation in knowledge strategy will lead to 0.68 of increased standard deviation in innovation.

According to the coefficients of Table (16), the regression line equation is as follows:

$$\text{Innovation} = 8.772 + (2.176) \text{ knowledge strategy}$$

Eighth sub-question: Is there a correlation between the organizational culture and staff innovation at departments of education in Tehran City?

Table 17: Summary of regression results about the correlation between the organizational culture and staff innovation

Multiple correlation coefficient	Coefficient of determination	of Adjusted coefficient of determination	Standard error of approximation
0.649	0.421	0.419	7.047

The results of Table 17 indicate that the multiple correlation coefficient is equal to $R=0.64$ and the coefficient of determination equal to $R^2= 0.42$ and the adjusted coefficient of determination equal to 0.41 ($p=0.05$ and $F= 229.954$).

Therefore, the coefficient of determination indicates that the organizational culture generally explains about 42% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

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Table 18: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	13.306	1.286		10.343	0.00
Organizational culture	1.371	0.090	0.649	15.164	0.00

As shown in Table (18), the multiple-correlation between the organizational culture and innovation indicates that the organizational culture is able to explain the dependent variable with beta of 0.64. In other words, one unit increased standard deviation in organizational culture will lead to 0.64 of increased standard deviation in innovation.

According to the coefficients of Table (18), the regression line equation is as follows:

$$\text{Innovation} = 13.306 + (1.371) \text{ organizational culture}$$

Ninth sub-question: Is there a correlation between the intellectual capital and staff innovation at departments of education in Tehran City?

Table 19: Summary of regression results about the correlation between the intellectual capital and staff innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.785	0.616	0.615	5.740

The results of Table 19 indicate that the multiple correlation coefficient is equal to $R=0.78$ and the coefficient of determination equal to $R^2=0.61$ and the adjusted coefficient of determination equal to 0.61 ($p=0.05$ and $F=507.126$). Therefore, the coefficient of determination indicates that the intellectual capital generally explains about 61% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

Table 20: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	7.843	1.114		7.038	0.00
Intellectual capital	2.264	0.101	0.785	22.519	0.00

As shown in Table (20), the multiple-correlation between the intellectual capital and innovation indicates that the intellectual capital is able to explain the dependent variable with beta of 0.78. In other words, one unit increased standard deviation in intellectual capital will lead to 0.78 of increased standard deviation in innovation.

According to the coefficients of Table (20), the regression line equation is as follows:

$$\text{Innovation} = 7.843 + (2.264) \text{ intellectual capital}$$

Tenth sub-question: Is there a correlation between the learning organization and staff innovation at departments of education in Tehran City?

Table 21: Summary of regression results about the correlation between the learning organization and staff innovation

Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Standard error of approximation
0.825	0.680	0.679	5.238

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The results of Table (21) indicate that the multiple correlation coefficient is equal to $R=0.82$ and the coefficient of determination equal to $R\text{ Square}= 0.68$ and the adjusted coefficient of determination equal to 0.67 ($p=0.05$ and $F= 672.415$). Therefore, the coefficient of determination indicates that the learning organization generally explains about 68% of variance in staff innovation as the dependent variable at departments of education in Tehran City.

Table 22: Coefficients of variables associated with the regression equation

Independent variable	Non-standardized Coefficients		Standardized coefficients Beta	t	Significance level
	B	Standard error			
Constant value	5.275	1.067		4.945	0.00
Learning organization	1.672	0.064	0.825	25.931	0.00

As shown in Table (22), the multiple-correlation between the learning organization and innovation indicates that the learning organization is able to explain the dependent variable with beta of 0.82. In other words, one unit increased standard deviation in learning organization will lead to 0.82 of increased standard deviation in innovation.

According to the coefficients of Table (22), the regression line equation is as follows:

$$\text{Innovation} = 5.275 + (1.672) \text{ learning organization}$$

Discussion

According to the first finding of this research, there is a significant correlation between the knowledge management and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Ariaz (2010), Choupani (2012) and Huang *et al.*, (2010).

According to the second finding of this research, there is a significant correlation between the leadership and management in organization and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Zahedi (2010), Molla-Hosseini and Barkhordar (2007), and Huang *et al.*, (2010).

According to the third finding of this research, there is a significant correlation between the teamwork and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Afkhami (2010), Asefi (2008), Jackson (1983) and Taleghani (2012).

According to the fourth finding of this research, there is a significant correlation between the knowledge sharing and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Cavusgil *et al.*, (2003).

According to the fifth finding of this research, there is a significant correlation between the knowledge creation and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Nasrollahi (2012) and Jourabchi (2008).

According to the sixth finding of this research, there is a significant correlation between the digital justice and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Salmani *et al.*, (2013), Ghafouri *et al.*, (2009), Badi and Sharif (2003), and Alvani *et al.*, (2008).

According to the seventh finding of this research, there is a significant correlation between the ideas and mission with innovation at departments of education in Tehran City. The result of this study is consistent with the research by Johnson (2008).

According to the eighth finding of this research, there is a significant correlation between the organizational culture and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Dehghan (2009), Lopez and Moreno (2011) and Halo (2003).

According to the ninth finding of this research, there is a significant correlation between the intellectual capital and innovation at departments of education in Tehran City. The result of this study is consistent with the research by Ghorbani *et al.*, (2012).

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According to the tenth finding of this research, there is a significant correlation between the learning organization and innovations at departments of education in Tehran City. The result of this study is consistent with the research by Ebrahimi *et al.*, (2013), Biglari (2010) and Moradi *et al.*, (2010).

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