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The Role of Knowledge Management Elements in the Improvement of the Faculty Members in Distance Education Universities(designing an appropriate model)

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Abstract

Background & Objective: Given the importance and status of faculty members in universities, the advancement of the duties and missions of the higher education system and rapid development of the technologies and challenges faced by educational institutions require proper measures for the continuous development and overall improvement of these systems, especially the improvement of the capacities, scientific capabilities, and professional skills of faculty members through knowledge management. The present study aimed to assess the role of the elements of knowledge management in the improvement of the faculty members in distance education universities by designing an appropriate model.

Materials and Methods: This applied, qualitative research was conducted on the faculty members of distance education research universities in Iran, including 5,101 faculty members. The participants were selected via stratified random sampling ($n=357$) and based on Morgan's table. Data were collected using a questionnaire. The validity of the research instrument was confirmed by experts, and its reliability was confirmed using the Cronbach's alpha, which was estimated at 0.89 for knowledge management and 0.91 for knowledge development items. Data analysis was performed in SPSS using the Kolmogorov-Smirnov test for data normalization. In addition, the path and fitting of the model were examined using structural equations in AMOS software.

Results: In this research, knowledge management indicators (creation, sharing, storage, and application of knowledge) affected all the improvement indicators (individual, professional, and organizational), so that the overall effect of knowledge management on improvement was estimated at 69.3 in the model fitting index table.

Conclusion: According to the results, knowledge management is a conscious strategy for creating, sharing, storing, and applying knowledge, thereby enhancing the performance of the faculty members in distance education universities and enabling them to become an efficient element of change in universities.



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Introduction

Today, organizations are formed as the collectives of workers with different spirits, interests, ideas, knowledge, and physical conditions, without which organizations would never exist. Organizational development depends on areas such as creativity, innovation, and extension, which increase the influence of organizations on the community (1). Knowledge of employees is considered to be the most valuable asset of every organization, so that adequate knowledge and its management become largely contribute to survival in dynamic and innovative organizations. Furthermore, competitiveness in markets and business depends on acquiring, developing, and updating individual and organizational knowledge in an era when intellectual structure is replete with deepening information, and creative and knowledge-oriented workforce participation is preferred over functional human resources (2). Therefore, in order to use knowledge tools to properly face uncertainty factors, maintain

knowledge management, and uphold creativity and innovation management, vigilant managers attempt to prioritize organizational knowledge as a strategic, essential matter of leadership in regards to competitiveness. On the other hand, the age of knowledge has brought about significant changes in the current organizational programs and systems. Knowledge management is a new term, which has gained growing importance in the theory and practice of management. This concept is used to describe the processes through which organizations generate and organize knowledge in order to achieve competitive advantage and make it available to all employees. In other words, knowledge management is the process of using the intellectual capital for superiority in competition with peer organizations (3). Davenport and Prosak (4) believe that knowledge management is the exploitation and development of the knowledge capital of an organization in order to achieve organizational goals.

According to the literature, Newman and Conrad (5)

classification, and Massa and Testa (6), the four general processes of knowledge management include knowledge creation, knowledge storage, knowledge transfer, and knowledge application. Newman and Conrad and Massa and Testa have presented a general pattern of knowledge, in which knowledge is organized in four main aspects.

Knowledge arises from the experience and skills of employees and is created by the individuals who identify new approaches to tasks and science development. Oftentimes, if there is no knowledge in organizations, outside knowledge will enter the organization (7), followed by all the organizational activities that lead to the survival and maintenance of the system. Knowledge storage activities encompass a variety of behaviors, such as the activities relating to the validity and updating of knowledge (8). The diffusion process is defined as the distribution of the knowledge of the activity and even beyond outside the organization. In other words, it involves the transfer of knowledge to any individuals who needs it through communication and organizational culture (9). General knowledge must be used in the products, services, and processes used in the organization. If an organization cannot easily determine the proper form of knowledge, it will face challenges in the competitive arena. Today, creativity is the road to success, and organizations must be able to apply the proper knowledge in the right sector. Application of knowledge encompasses the activities that use knowledge in business processes (10).

Peter Drucker (11) believes that the secret to success in the 21st century is the proper implementation of knowledge management. As such, the implementation of knowledge management is considered essential in third-millennium organizations, and institutions must have proper planning for its implementation. Organizational success largely depends on the effective collection, storage, and retrieval of knowledge among the employees on various organizational levels (12). Sharing knowledge and creativity play a key role in the application of knowledge. Therefore, it could be stated that knowledge management has two components, including knowledge management and the ability to create new knowledge in line with the rapid changes of the environment. The second component of knowledge management is of most interest to organizations since it results in the facilitation and improvement of creativity and innovation, providing competitive advantage to organizations (13). Higher education systems should

adopt long-term strategies for the sustainable improvement of faculty members, so that they could be integrated into the rapidly-changing higher education and result in the effective achieving of academic goals (14). The success of any organization depends on the quality of its human resources, which could only be obtained through the systematic implementation of proper training and staffing programs (15).

Several studies have been focused on various aspects of productivity in faculty members and higher education institutions. Undoubtedly, the majority of studies on the individual and departmental levels have emphasized on measuring the research productivity of faculty members (16). For instance, Rajaeipour and Rahimi (17) have claimed that increasing the capacity of university managers on different levels and assessment of its elements are effective in the promotion of university research performance. Kerass coined the term 'distance learning', which refers to the types of training that use the internet and intranet technology for learning. In this regard, Kooper (18) defines e-learning as a set of training activities that occurs using electronic devices (e.g., audio, video, computer, and network). Furthermore, Mayer (19) defined the concept of electronic education, referring to it as active and intelligent learning, which plays a pivotal role in the expanding, deepening, and stabilizing of cultural information and communication technology, while changing the teaching-learning process. Taking advantage of rapid advances in communication technology rather than the primary forms of correspondence education, distance learning has become widespread through rapid evolution. The educational services that are provided at a distance using new communication tools owing to the technical progress of mass media, as well as the attention of researchers to the socio-educational dimension of technological progress, have yielded such remarkable outcomes that both developed and developing countries have incorporated the related strategies, including distance learning, into their educational programs (20).

The application of knowledge management in distance education universities could be greatly beneficial for improving the quality of educational, research, executive, and effective management, as well as increasing and optimizing creativity, which in turn result in the mobility and prosperity of these universities as the heart of the country's educational and research community.

The present study aimed to assess the role of the components of knowledge management in the development of the faculty members of distance education universities by designing an appropriate model.

Materials and Methods

This applied, qualitative-quantitative research was conducted on the faculty members of the distance learning administrator universities in Iran. The sample population consisted of 5,101 faculty members selected from Payam-e Noor University, Khaje Nasir al-Din Toosi University of Technology, Tehran University, Iran University of Science and Technology, Amirkabir University of Technology, Tehran Polytechnic University, and Tarbiat Modares University. Using Morgan's table, the sample size was determined to be 357. Sampling was performed in the stage of the qualitative component identification of the faculty members of the mentioned universities ($n=50$). Using quantitative sampling, the participants were randomly selected from the faculty members of the mentioned universities.

Data were collected via interviews and using questionnaires. In the first stage, the qualitative data were collected, and the necessary field for the preparation of the measurement tools was provided. A semi-structured interview was conducted with the participants ($n=50$), and similar interview questions were prepared for the respondents. The participants were free to answer the questions in any manner. After a literature review, the interview questions were prepared about knowledge management indicators and development of faculty members in the individual, professional, and educational dimensions in collaboration with the content supervisor to confirm the quality. Afterwards, in order to cover all the domains and assure the flexibility of the semi-structured interview, the interviews were carried out to saturate the categories. In the final stage, the texts of the interviews were analyzed. The main categories were considered based on the literature review and analysis of the interviews texts, and the sub-categories and their subscripts were identified as well. At the next stage, quantitative data were collected using researcher-made questionnaires consisting of a quality section, which was an unstructured questionnaire regarding the components extracted from theoretical foundations and the questionnaire survey conducted by experts ($n=15$), and a quantity section, which was a semi-structured questionnaire regarding the qualitative review of the components

extracted by experts. The questionnaires were completed by 50 management professors. In addition, a structural questionnaire was used to examine the current status of the extracted components in the sample population. The questionnaire was completed by 357 participants, and their views were investigated. The descriptions were based on the statements and behaviors of the interviewees. For data collection, the researcher used two types of self-made questionnaires, including the questionnaires of knowledge management and faculty member improvement.

A. Knowledge Management Questionnaire: This was a researcher-made questionnaire based on the literature review, which consisted of 22 items regarding knowledge management dimensions (creation, storage, transfer, and application).

B. Improvement Questionnaire: This was a researcher-made questionnaire, the mean validity of which was confirmed by a supervisor and other field management specialists ($n=50$). It consisted of three elements regarding overall improvement (seven items), organizational improvement (seven items), and educational improvement (nine items) (total: 23 items), which were scored based on a five-point Likert scale (Very Low, Low, To Some Extent, High, Very High). The mean reliability of this questionnaire was confirmed using the Cronbach's alpha, which was estimated at 0.82 for the knowledge management items and 0.91 for the improvement items. In addition, confirmatory factor analysis was used to evaluate the validity of the questionnaire. According to the information in the tables, the load factors of more than 0.3 indicated the validity of the questionnaire.

The research findings were analyzed using structural equation modeling. Initially, data normality was assessed using the Kolmogorov-Smirnov test, and the correlations between the three variables of knowledge management and improvement were evaluated using correlation-coefficients. Moreover, a structural equation model, which was a combination of path analysis graph and confirmatory factor analysis, was used to analyze the path and model fitness in the AMOS software. The research questions were addressed, and the Lisrel software was employed for data analysis. To assess the validity and adequacy of the data based on the Kaiser-Meyer-Olkin (KMO) index, Bartlett's test was used to examine the correlation matrix, and fitness index root mean square error of approximation (RMSEA) was applied to fit the structural equation models.

Result

Qualitative Analysis

The following categories represent the results of the interviews with the faculty members, organizational limitations, organizational climate, managerial barriers, and possible approaches to improving the quality of education at the distance education universities. According to the interviewees, the strategies and educational programs of the universities did not meet the needs and expectations of the students and community, which reduced the

quality of education, giving rise to dissatisfaction. Quality has various indicators, such as the satisfaction of students and faculty members with the educational status of the university, and increasing the participation and cooperation of individuals in the less relevant activities of the university. Today, scientific findings in various fields are rapidly increasing and changing, while some faculty members use their outdated information and knowledge, which are not in line with new findings.

Table 1: Current status of the variable of knowledge management

Variables	Average	Standard deviation	T	Significance
Knowledge Creation	55.99	23.991	40.701	0.000
Knowledge Transfer	56.71	23.610	50.358	0.000
Knowledge Application	56.20	29.895	30.906	0.000
Knowledge Management	56.25	22.966	50.129	0.000

To assess the current status of knowledge management in the distance education universities, one-sample t-test was used (Table 1). According to the information in Table 1, the mean value was higher than the average benchmark in all the components. According to the results of one-sample t-test, the difference between the mean variable and standard mean was significant and applicable to the population. Therefore, it could be inferred that in all the components, the knowledge management variable was above average.

To assess the current status of the improvement of faculty members, one-sample t-test was used in the distance education universities (Table 2). According to the information in Table 2, the mean was higher than the average benchmark in all the components. According to the results of one-sample t-test, the difference between the mean variable and standard mean was significant and applicable to the population. Therefore, it could be inferred that in all the components, the improvement variable was above average.

Table 2: Current status of faculty development

Variables	Average	Standard deviation	T	Significance
Educational improvement	64.94	18.361	15.328	0.000
Organizational improvement	59.43	24.545	7.236	0.000
Individual improvement	66.29	20.043	15.311	0.000
Improvement	63.67	18.519	13.909	0.000

To investigate the correlation between knowledge management and the improvement of faculty members in the distance education universities, Pearson's correlation-coefficient was used (Table 3). According to the information in Table 3 and results of Pearson's correlation-coefficient, there was a

strong and direct correlation between knowledge management and improvement of the faculty members. The Pearson's coefficient-coefficient was estimated at 0.678, and its corresponding significant was 0.000. Due to the significance level of less than 0.01 and considering 1% error, the observed

correlation was applied to the population. As a result, there was a correlation between knowledge management and improvement variables in the sample population of the study. Therefore, H0 was

rejected, and H1 was accepted, with the coefficient determined to be 0.46, indicating that the knowledge management variable defined 46% of the improvement variance.

Table 3: Relationship between knowledge management and the development of faculty members

Independent variable	Knowledge management
Dependent variable	Improvement
Pearson correlation coefficient (R)	0.678
Determination coefficient (R Square)	0.46
Sig	0.000

Model Fitness and Path Analysis

Path analysis and evaluation of the structural equation model fitness were performed using the AMOS software. Figure 1 depicts the analytical model of the correlation between knowledge management and creativity. The value of the arrows, path coefficients, and values of the rectangles show the values of the defined variances. It is notable that

smaller CMIN/DF indicated better fitness, and the cutoff point of fitness was estimated to be five. Moreover, if the RMSEA index was closer to zero, it indicated better fitness (cutoff point: 0.05-0.10). The other indicators (CFI and IFI) also represented a better fitness if they were closer to one (cutoff point: 0.90).

Table 4: Causal effect of variables

Independent variable	dependent variable	direct impact	Indirect effect	Total causal effect
knowledge management	improvement	0.14	0.553	0.693

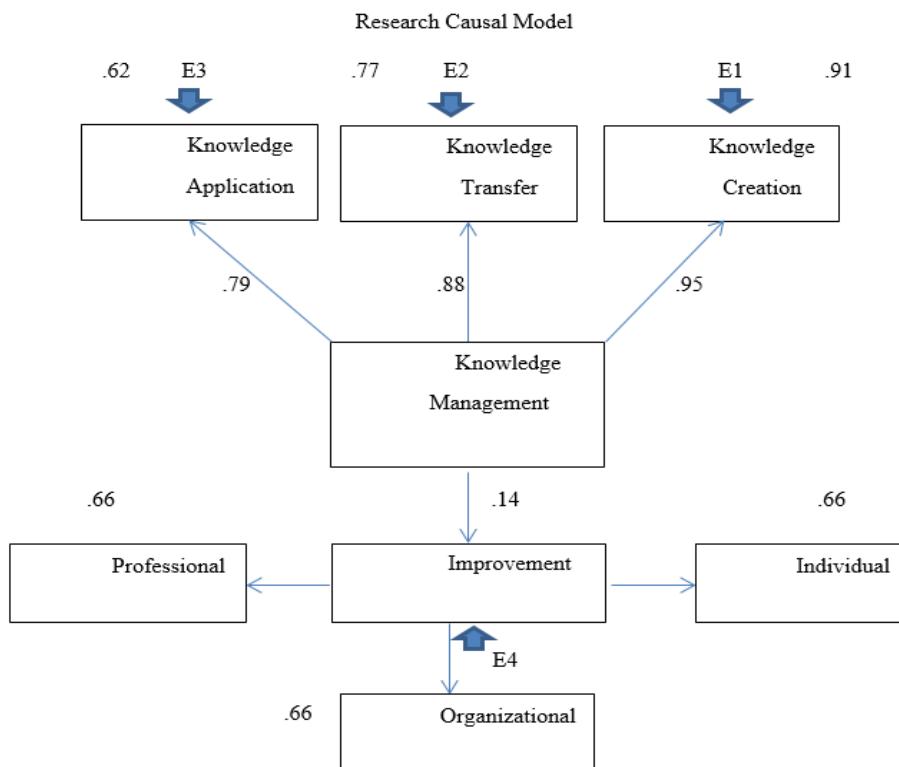
Table 5: Model fitting indices

Chi square	CMIN (Chi square)	Freedom degree	CMIN/df	IFI	CFI	RMSEA
	46.806	4	11.701	0.971	0.971	0.174

According to the results of Chi-square, the division by the freedom degree was 11.701. Additionally, the IFI, CFI, and RMSEA values were determined to be 0.971, 0.971, and 0.174, respectively. Based on the

four indicators related to the model fitness, two indices were ideal, and the other indices were slightly different. Therefore, the model was considered to have good fit with tolerance.

Research Causal Model



Discussion

Based on the results of the present study and due to the high value of the average criterion in all the components, the current status of knowledge management in the studied distance education universities was favorable, and the universities had a proper atmosphere, freedom for the implementation of the theories and ideas, and a culturally appropriate atmosphere for knowledge exchange among the employees, while they also welcome disclosing knowledge and have the ability to work in groups. In addition, there are mechanisms and tools in these universities to convert tacit knowledge into explicit knowledge and use knowledge as a key to success and competence. Therefore, it could be stated that in all the components, the knowledge management variable was above average. The findings of the current research are consistent with the studies by Niazazari and Amuei (21), Jourabchi (22), Pirkhaefi (23), and McCain and Zac (24). Accordingly, the success of every university requires the engagement of all the faculty members in the implementation of knowledge management.

Scientific attention to the improvement of faculty

members and designing proper knowledge management models to show the extent of enforcement at the universities executing distance learning is rooted in the belief that the improvement of faculty members could create and maintain the human capital in universities and research training centers. Considering that the quantitative and qualitative loss of faculty members severely affects quality improvement and academic performance, providing comprehensive growth conditions for university experts is of paramount importance. According to the results of the present study, the current status of the improvement of faculty members in distance learning universities was favorable owing to the high value of the average criterion in all the components. This is in line with the studies by Poorkarimi (25), while inconsistent with the results obtained by Watson (26), Ijtihadi et al. (27), Jafari Moghadam (28), and Naeem Yahkhan (29). Accordingly, human resources are considered the most valuable capital of an organization in knowledge organization, and powerful human resources are influential in the knowledge management process; the foremost approach in this

regard is the training of the faculty members on new skills.

Conclusion

The results of Pearson's correlation-coefficient indicated a strong, direct correlation between the two variables of knowledge management and improvement of the faculty members. This is in congruence with the results obtained by Murry (30) and Lee et al. (31). Furthermore, a significant correlation was observed between knowledge management and the improvement of the faculty members of the distance education universities. Based on the results of the present study, it could be stated that in the universities executing distance learning, knowledge management is applied as a conscious strategy to create, store, transfer, and apply knowledge to improve the faculty members of the universities. Therefore, attention must be paid to the intellectual capital and its management at universities in order to enhance the personal, educational, and organizational development of the faculty members. As a result, the high intellectual capital leads to the improved organizational performance and increased productivity.

In order to institutionalize knowledge management at the universities providing distance learning, educational managers are required to focus on the role of the tacit knowledge of the faculty members and their importance in the development of organizational knowledge. Based on the results of the present study, it is suggested that universities pay special attention to the dimensions of the faculty members' improvement (individual, professional, and educational) and its subcategories in the design and implementation of the programs and activities regarding the improvement of the faculty members. In order to increase the participation of faculty members in educational programs and facilitate their activities, it is suggested that higher education officials steer clear of their formal, stereotypical status and provide the necessary fields of hardware and software for the proper participation of the faculty members. For the growth of universities, use of potential intellectual capacity and faculty members' mental capabilities is essential.

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