International Journal of Knowledge Management
Volume 12 • Issue 4 • October-December 2016

The Role of Motivation, Ability, and Opportunity in Achieving Effective Knowledge-Work:
Knowledge Work and MAO

Rezvan Hosseingholizadeh, Ferdowsi University of Mashhad, Department of Education, Mashhad, Iran
Somayyeh Ebrahimi Koushk Mahdi, Ferdowsi University of Mashhad, Department of Education, Mashhad, Iran
Hadi El-Farr, Rutgers University, School of Management and Labor Relations, Piscataway, NJ, USA

ABSTRACT

This study aims to empirically test the impact of the Motivation-Ability-Opportunity- (MAO) model on knowledge work. We propose that knowledge work is a function of employees' motivation, ability and opportunity. In this regard, the aim is to provide empirical support to explain the effects of motivation, ability and opportunity on knowledge-work, which we defined as a knowledge-centered behavior. Data was collected through a self-report questionnaire. A sample size of 350 employees of Ferdowsi University of Mashhad answered the questionnaire. Structural equation modeling techniques and hierarchical multiple regression analyses were conducted on hypothesis testing. The findings confirm that motivation, ability and opportunity independently influence knowledge-work behavior. Also, results revealed that both intrinsic and extrinsic motivation has significant influence on knowledge work; however intrinsic motivation has a higher effect than extrinsic motivation.

KEYWORDS

Knowledge Management, Knowledge Work, Knowledge Worker, Motivation, Ability, Opportunity

INTRODUCTION

Scholars are increasingly highlighting the role of knowledge management (KM) in achieving better decision making and problem solving (Alavi & Leidner, 2001; Hoq & Akter, 2012). The most prominent literature on KM has viewed it as an organizational initiative - emphasizing the importance of organizational factors that influence KM effectiveness. KM is a system that aims to improve organizational effectiveness (Jennex, Smolnik & Croasdell, 2009). From this perspective, KM success within firms is a function of technological, organizational and environmental factors; including strategy, leadership/management support, knowledge content, processes, technology and structure (e.g. Yew Wong, 2005; Jennex & Olfman, 2005; Jennex, et al., 2009; 2012; Basu & Sengupta, 2007; Lin, 2014; Sedighi, van Splunter, Zand & Brazier, 2015).

That said the literature has focused less on the role of individual employees in the KM discourse (Muhammed, Doll & Deng, 2009; Hoq & Akter, 2012). Scholars focusing on the Human Resources perspective of KM have argued that the human capital has the most potential to serve as a source of competitive advantage (Jiang, Lepak, Hu & Baer, 2012). Employees are supposed to be able to identify and solve difficult and complex problems, counting on their abilities, imagination, creativity

DOI: 10.4018/IJKM.2016100102

Copyright © 2016, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

and high-level of education (Rao, 2010). Employees – knowledge workers – are the ones who are engaged in knowledge-work activities, and within them resides KM success (Hoq & Akter, 2012). From this perspective, other factors in the KM system are viewed as merely enablers to KM success.

Traditionally KM focused on explicit knowledge (knowledge-codification) and organizational knowledge. Linking the individual-knowledge perspective to organizational success suggests a shift from traditional KM to personal KM (PKM) – focusing on individual and tacit knowledge (Cheong & Tsui, 2011; Muhammed et al., 2009). Knowledge workers add value to organizations due their tacit-knowledge and their ability to transfer it into work activities (Davis, 2002; Mládková, 2012). They depend on their personal-knowledge more than the organizational-knowledge in work activities (El-Farr, 2009). Due to the intangibility of tacit-knowledge, knowledge workers are difficult to manage, yet utilizing appropriate practices to enable them provides organizations with a unique competitive advantage (Mládková, 2012).

How to manage, improve and measure knowledge-work became central in the literature - arguing that effective knowledge-work activities such as knowledge creation, sharing and application are core goals for effective KM systems (Timonen & Paloheimo, 2011; Palvalin, Vuolle, Jääskeläinen, Laihonen, & Lönnqvist, 2015). That said, effective knowledge-work is mostly dependent on the performance of individual knowledge workers who drive the success of knowledge-intensive organizations (Drucker, 1998; Rao, 2006).

A typology of knowledge worker definitions, roles and knowledge-work actions could be deduced from the literature. Knowledge-work often is defined as a discretionary behavior and a system of activities that knowledge workers opt to do. Thus, knowledge workers are viewed as volunteers, investors, valuable resource, self-directed learners and individual innovators and performers (Muhammed et al., 2009; Efimova, 2004; Kelloway & Barling, 2000; Drucker, 1998; Davenport, 2010; Ho, 2008). Therefore, managing knowledge-work should be mostly focusing on establishing conditions that increase the likelihood of knowledge workers to make the "right" choices. Knowledge workers make voluntary choices of when, how much and where to invest their knowledge and energy at work (Efimova, 2004). They are likely to engage in knowledge -work to the extent that they have the motivation, ability and opportunity to do so (Kelloway & Barling, 2000).

More recently, researchers have drawn upon the motivation- ability- opportunity (MAO) model of HRM and suggest that employee performance is a function of those three essential components (Hutchinson, 2013; Jiang et al., 2012; Okorogu, 2015). The MAO framework has successfully explained how and why motivation, ability and opportunity affect a wide range of organizational behaviors, among those are knowledge-work behaviors (Argote, McEvily & Reagans, 2003).

Moreover, Wright (2005) noted that individual workers apply knowledge processes to support their day-to-day work activities – broadly characterized as problem solving and learning practices. Especially, as highest centers of learning, universities need to build information infrastructure and create a favorable atmosphere where teaching and non-teaching staff can take part in various KM activities. Most university employees could be considered as knowledge workers; they are expected to have major roles in formulating the strategies and processes of modern universities. Moreover, university employees have an active role in changing universities' organizational cultures and individual behaviors relative to knowledge-work (Davenport & Prusak, 1998; Hoq & Akter, 2012).

Overall, while there is an increasing attention paid to organizational factors of KM success, there has been relatively little discussion about the role of the individual employee in KM success. Focusing on the personal-knowledge perspective in KM success has a lot of potential in the KM literature. In that respect, Muhammed et al. (2009) pointed that KM success depends upon the KM practices used by individuals. DW Rechberg and Syed (2014) highlighted the need for individuals' participation as

a mandate for achieving a successful KM strategy. In fact, lack of individuals' participation in KM may not only hinder knowledge creation, but may also lead to a decline in organizational knowledge.

Thus, this study takes the perspective of personal KM (PKM). Knowledge workers are the ones responsible of creating, sharing and applying knowledge at work. As Barth (2001) noted "KM cannot succeed unless every knowledge worker takes personal responsibility for what he or she knows and doesn't know" (From Tsui, 2002: 4). Then, building on the well-established MAO model of HRM, the purpose of this paper is to examine the influence of MAO and the interaction among them on knowledge-work activities. Also, the context of this study is university employees – a representative sample of knowledge-workers.

THEORATICAL BACKGROUND AND HYPORTHESES

Knowledge Work and Knowledge Worker

The term knowledge worker was first coined by Peter Drucker in 1959 (Widmann, 2013). Drucker (1969) and Daniel Bell (1968) were the main influencers when the concept emerged in the scientific discussion from 1974 to 1992. After this period, we can distinguish a slow diffusion period from 1993 to 2003, when the concept started to gain attention, and a fast diffusion period from 1999 to 2003, when the research proliferated (Timonen & Paloheimo, 2011). Based on the variety of existing definitions, many scholars claim that both concepts, knowledge-work and knowledge workers, are still ambiguous (Timonen & Paloheimo, 2011). The problem with defining knowledge-work is the argument that knowledge is a mandate to achieve any work activity (Palvalin et al., 2015). In the literature, there is a wide range of definitions for knowledge-work. That said, classifications of knowledge-work could be deduced, and they are discussed in following.

First, Knowledge work is defined as a profession. It is the dominant traditional perspective in the literature. Through the 1990s the common definition of knowledge workers was that they were highly educated, well skilled and were differentiated based on information technology criteria (Rao, 2006). Knowledge-work is conceptualized as overlapping significantly with professional occupations that are dominated with knowledge-intensive tasks including scientists, engineers, professors, attorneys, physicians and accountants (Hislop, 2008). In this perspective, knowledge-work is defined usually by broad measures such as job titles or education levels (Mládková, 2015; Cooper, 2006 cited in Widmann, 2013). The definition of knowledge-work as "professional work" is commonly found in research within occupational groups, such as lawyers, accountants, consultants, and medical professionals (Olsen, 2016). Knowledge-intensive work can either be based on scientific knowledge, such as in research and development occupations, high-technology engineering, or can be considered as professional work, such as lawyers and accountants (Widmann, 2013). It sounds that this approach is dependent on job content and industry driven approaches, identifying knowledge workers as employees within a specific set of occupations and those who work in particular organizations or in particular sectors or institutions (Mládková, 2015).

This perspective has been criticized due to its constrained view of knowledge-work. Knowledge-work cannot be only deduced through looking at job titles or educational levels. Thompson, et al. (2001) suggests that the emphasis on abstract theoretical knowledge leads to the neglect of other important types of knowledge required to accomplish tasks. An example is tacit-knowledge that does not necessarily reflect high levels of formal education or the occupation of knowledge-intensive professions (cited in Hislop, 2008). Tacit knowledge is embedded in the behavior, attitude, perception, ideology and beliefs of individuals (Hoq & Akter, 2012). Knowledge workers add value to organizations due their tacit-knowledge and their ability to transfer it into work activities (Davis, 2002).

Second, Knowledge-work is defined as a dimension of work and individual activity. This approach focuses on what employees actually do in their day-to-day activities: knowledge-work is defined in terms of the balance of 'thinking' and 'doing' activities. Drucker (1998) defines knowledge-work as comprising those jobs in which incumbents work more with their heads rather than with their hands.

Based on this perspective, all workers are knowledge workers to a certain extent, depending on the nature and intensity of the possessed skills and working knowledge, rather than just claiming it as the possession of a minority group (Collins, 1997). In this view, knowledge-work is not a category and is not an occupation, but is a dimension of work.

Thus, knowledge-work is defined as a set of employee activities. In this regard, Davenport (2010) takes a "process" perspective on knowledge-work. He suggests that the process orientation differs by whether workers create knowledge, share it, or apply it. According to Davenport's (2010) definition, knowledge workers have high degrees of expertise, education, and experience. Moreover, the primary purpose of their jobs involves the creation, distribution, or application of knowledge.

In this paper, we apply the term knowledge workers within the broader category of highly skilled workers. Based on perceiving knowledge-work as individual activity and as a dimension of work, knowledge-work is characterized by self-management (Davis, 2002) and knowledge workers are best described as investors. As investors, employees choose the time and extent of investing their knowledge and often have the power to resist being told what to do (Davenport, 2010; Kelloway & Barling, 2000). Moreover, Davenport (2010) defined knowledge-work within three different activities: knowledge-creation, knowledge-sharing and knowledge-application. Each of these activities is seen as a discretionary behavior. Employees are likely to engage in knowledge work to the extent that they have the motivation, ability and opportunity to do so (Kelloway & Barling, 2000). Hence, the implicit assumption of this study is that the success of knowledge-work depends on motivation, ability and opportunity of knowledge workers to create, share and apply knowledge.

Motivation, Ability, and Opportunity to Knowledge Work

The MAO framework is a well-established model for explaining work performance. Initially proposed by Bailey (1993) and developed by Appelbaum et al (2000), MAO has become a commonly accepted framework to explain how human resource (HR) policies might influence employees' performance (Hutchinson, 2013). This model suggests that a person's "capacity to work", "will to work" and "opportunity to perform" jointly determine the level of performance (Kelloway & Barling, 2000; Tuuli, 2012). The MAO framework also has been successfully employed to explain a wide array of behaviors such as consumer behavior, commercial information process and public relations (Hallahan, 2001), and firm-level decision-making and social capital activation (Binney, Oppenheim & Hall, 2006). More recently, MAO has been used as a conceptual framework for explaining knowledge sharing behaviors (e.g., Chang, Gong & Peng, 2012; Siemsen, Roth & Balasubramanian, 2008). Therefore, MAO might help in explaining how and why certain contextual individual properties affect KM outcomes.

Motivation to Knowledge Work

In the context of the MAO theory, motivation to knowledge-work refers to heightening arousal so that employees could be ready, willing, or interested in implementing knowledge-work (Hallahan, 2001; Leung & Bai, 2013). They cannot be enforced to share their knowledge but can be motivated to willingly do so. KM initiatives' failure or success depends to a high extent on the knowledge workers' willingness to adopt new practices and tools (Hussain, Ahmed & Si, 2010; Efimova, 2004). Ajmal, Helo and Kekäle (2010) revealed that the absence of incentives for employees who engage in KM initiatives was the most significant barrier to the success of KM initiatives in project-based firms. According to Yew Wong (2005) if individuals are not motivated to practice KM activities, then no amount of investment, infrastructure and technological intervention will make KM effective. Gumusluoglu and Karakitapoglu-Ayglin (2010) observed that knowledge workers were generally attracted to careers that allowed them to develop their potential, stimulated their personal and intellectual capacity, and encouraged them to develop their career goals.

In examining motivation, Ryan and Deci (2000) distinguished between extrinsic motivation and intrinsic motivation. Research has emphasized the crucial role of intrinsic motivators in enforcing

knowledge-work behaviors such as knowledge-sharing, transfer and contribution (e.g. Lin, 2007; Cruz, Pérez & Cantero, 2009; Huang, Chiu & Lu, 2013). Incentives help to stimulate and reinforce positive employee behaviors and culture needed for effective KM (Yew Wong, 2005). According to Jones and Chung (2006), Knowledge workers are more motivated with intrinsic motivators as compared to extrinsic motivators. They identified examples of intrinsic motivators, such as providing challenging work assignments, personal recognition, and realistic promotional opportunities. Farr and Brazil (2009 as cited in Widmann, 2013) provided some intrinsic motivators of engineers, including opportunities for self-actualization, learning, and continued professional development.

That said both intrinsic and extrinsic rewards are important to increase employees' willingness to share their knowledge, especially tacit knowledge (Huang et al., 2013). Thus, this study applies expected organizational rewards and reciprocal benefits as extrinsic salient determinants and self-efficacy and enjoyment in helping others as employees' intrinsic salient determinates to explain knowledge-work behavior.

Hypothesis 1: Intrinsic and Extrinsic motivation will be positively related to knowledge-work, such that employees performing knowledge-work are more motivated by intrinsic motivators than extrinsic motivators.

Ability to Knowledge Work

Ability refers to the extent to which individuals have the necessary resources (e.g. knowledge, intelligence, money) to make an outcome happen (Leung & Bai, 2013). It refers to individuals' skill or proficiency at solving problems or their knowledge of how to act (Binney et al., 2006). Accomplishing knowledge-work is a result of personal capability, such as skills, experience, or intelligence. According to Argote et al. (2003) individual abilities are partially innate, but they are also enriched through training and experience; formal and informal mechanisms of accumulating personal human capital. Individuals' embedded ability to create meaning of things, reflect and interpret situations has a crucial role in effective KM (DW Rechberg & Syed, 2014).

Several studies have also recognized the role of ability in knowledge sharing (Siemsen et al., 2008). Hussain et al. (2010) showed that individuals who possess more personal-knowledge capabilities are more effective in performing KM activities and ensuring KM success. Therefore, if knowledge-intensive organizations are the ones that attain their competitive advantages based on the uniqueness of embedded knowledge within their individual employees, then their knowledge workers' abilities are the essential determinate for organizational success.

In this study, the employees' ability to conduct knowledge-work refers to the extent of their embedded personal-knowledge and skills that enable them and are required to implement knowledge-work activities and tasks (Siemsen et al., 2008). Thus, highly able or knowledgeable individuals are presumably more capable of creating, sharing and applying knowledge than individuals with low-ability.

Hypothesis 2: Ability is positively related to knowledge-work such that this relationship will be stronger for employees of high-ability than those with low ability.

Since motivated employees make use of their cognitive, affective and conative abilities to achieve organizational goals (Kaur, 2015; Binney et al., 2006), thus it seems motivation has impact on knowledge-work through ability as a mediator variable.

Hypothesis 3: ability has a mediator role in the relationship between motivation and knowledge-work.

Opportunity to Knowledge Work

Opportunity in the MAO framework refers to the situational factors that can either enhance or impede information processing. MacInnis and Jaworski (1989) identified several situational factors such as time availability, attention paid, and number of distractions (cited in Leung & Bai, 2013). Chang et al. (2012) stated that knowledge does not easily transfer unless the knowledge-transfer agents have sufficient motivations and opportunities to transfer knowledge. In addition, Argote et al. (2003:578) argue that "ability and extra effort are even more valuable when coupled with opportunity". Siemsen et al. (2008) stated that one of the most important operational constraints among coworkers is time. Cleveland and Elli (2015) revealed that knowledge seeking behaviors depend to a large extent on the perceived time available to the knowledge seekers. In this study, we define time availability (TA) as the degree to which an employee has slack time available to participate in knowledge-work activities.

Hypothesis 4: Opportunity is positively related to knowledge-work such that this relationship will be stronger for employees of high- time availability than those low in time availability.

The precise inter-relationship among the MAO variables and how they interact to influence performance behaviors still remain largely unclear. Three competing models, a multiplicative, linear and constraining-factor model (CFM), reflect different levels of complementarity and interaction among motivation, ability and opportunity, and their impact on performance behaviors are specified (Tuuli, 2012). While there is some theoretical evidence to suggest that MAO are complementary in driving behavior, existing empirical evidence from work-performance theories suggests that little explanatory power is gained by adding interaction terms (Siemsen et al., 2008). This paradox leads Siemsen, et al. (2008) to propose an alternative model referred to as CFM. The central notion of this model is that in the absence of any of the MAO variables, no action will take place, but it does not additionally impose a continuous change in the size of the effect. From this perspective, multiplicative model does not exhibit a significantly improved fit over a linear model. Also, Minbaeva (2013) stated that none of the studies simultaneously considered the interaction effects among motivation, ability and opportunity. There is limited empirical evidence available about the joint effects and roles of motivation, ability and opportunity on knowledge-work activities.

Hypothesis 5: the multiplicative interaction among motivation, ability and opportunity will not explain significantly more variance than the linear model.

METHOD

Participants

This study was conducted at Ferdowsi University of Mashhad (FUM) using a quantitative methodology - utilizing a survey instrument to collect data. We sent the survey to 1,245 staff of FUM. A total of 350 completed questionnaires were returned. The response rate was 28.11%. A total of 170 participants were females (48.6 percent) and 180 participants were males (51.4 percent). Most participants have high-level education. The average work tenure was 14.75 years. Basic information of respondents and companies are depicted in Table 1.

Measures

Measurement items were developed on the basis of a comprehensive review of the literature and modified to suit the KM context. Knowledge work was assessed with 11 items based on Chennamaneni et al. (2012), North and Gueldenberg (2011), and Siemsen et al. (2008). The items measured the extent to which employees create, share and apply knowledge during their day-to-day work activities.

Table 1. Basic information of Participants

Participants Characteristics	Frequency	Percent
Gender		
Male	180	51.4
Female	170	48.6
Education Level		
Diploma	47	13.4
B.A.	167	47.7
M.A.	118	33.7
Ph.D.	14	4
Years of tenure		
<5	43	12.3
5-10	71	20.3
10-15	56	16
15-20	48	13.7
20-25	83	23.7
>25	31	8.9
Occupation		
Administration	22	6.3
academic and graduate affairs	38	10.9
research and technology	45	12.9
cultural and student affairs	21	6
finance	51	14.6
planning and budgeting	59	16.9
faculty	99	28.3

Note: n = 350

Motivation was measured by 22 items that are adapted from Lin (2007), Cruz et al. (2009), and Kankanhalli, Tan & Wei (2005). The items reflect the extent to which employees believe that they will receive extrinsic and intrinsic incentives through their knowledge activities. A total of 3 items measuring opportunity were adapted from Siemsen, et al. (2008), measuring the extent of time that employees spend to create, share and apply knowledge. Finally, ability of employees to create, share and apply knowledge and experience was assessed by 4 item adapted from Siemsen et al. (2008) and Lee, Lee & Kang (2005).

Analytical Procedures

The data was analyzed based on structural equation modeling (SEM) techniques. The SEM process centers around two steps: validating the measurement model and fitting the structural model. The former is accomplished primarily through confirmatory factor analysis using LISREL, a software package based on SEM techniques. The latter is accomplished primarily through path analysis with latent variables analysis (Garson, 2008). We used partial least squares (PLS). PLS assesses the structural model - relationships among constructs. Moreover, the multiplicative interaction among MAO in hypotheses 4 was tested by using hierarchical linear modeling. Since the data was self-reported, all construct items were subjected to principal components factor analysis. The results indicated that multiple factors emerged to explain the data variance. Therefore, CMV does not appear to be a serious concern for this study.

RESULTS

Measurement Model

The measurement model is that part of a PLS model which deals with the latent variables and their indicators. The measurement model of all constructs was evaluated to demonstrate the quality of the measurement. In this study, the measurement model with all four constructs (knowledge work, motivation, ability and opportunity) was assessed using confirmatory factor analysis. Table 2 shows loadings and the corresponding t-values of indicators in the measurement model. Overall, all loadings exceed 0.6 and each indicator is significant at 0.05 levels. Also, the reliability of the constructs (composite reliability), and the average variance extracted were used as the measures for convergent validity. The composite reliability should be greater than 0.5 and the average variance extracted should be at least 0.6., but we can accept 0.4. (Fornell & Larcker, 1981). Hence, the measurement model seems to possess adequate convergent validity.

The measurement model exhibited a good level of model fit. For knowledge work construct, the chi-square/degrees of freedom ratio is 245.58/87. The GFI is 0.93, AGFI is 0.96, NFI is 0.93, CFI is 0.91, and RMSEA is 0.082. For motivation construct, the chi-square/degrees of freedom ratio is 4745.39/1793. The GFI is 0.93, AGFI is 0.95, NFI is 0.91, CFI is 0.92, and RMSEA is 0.078. For ability construct, the chi-square/degrees of freedom ratio is 5.29/2. The GFI is 0.97, AGFI is 0.91, NFI is 0.92, CFI is 0.94, and RMSEA is 0.082. For opportunity construct, the chi-square/degrees of freedom ratio is 29.19/9. The GFI is 0.93, AGFI is 0.90, NFI is 0.91, CFI is 0.89, and RMSEA is 0.077. Goodness of fit measures for the constructs of research model presented in Table 3.

Structural Model

The structural model analysis was conducted to examine the hypothesized relationships among constructs. The results from the structural model are shown in Table 4 and Figure 1. The results provided support for all the first four hypotheses. All of the path coefficients were statistically significant ($p < 0.05$) and greater than 0.30, which is considered meaningful. The relationship between motivation and knowledge work is statistically significant; thus, intrinsic and extrinsic motivation will be positively related to knowledge work. That said, intrinsic motivation has more influence on knowledge work than extrinsic motivation. Linear regression results showed that Self-efficacy (b = 0.70, SE = 0.032, p<.05) and enjoyment in helping others (b = 0.46, SE = 0.029, p<.05) as intrinsic motivation indicators have positive impact on knowledge work more than organizational rewards and reciprocal benefits as extrinsic motivation indicators.

The R^2 indicates the amount of variance explained by the model. R^2 value determines the prediction power of the model. As showed in Table 3, approximately 72.5% of the changes in knowledge work are explained by motivation, ability and opportunity, and 44.3% of the changes of ability are explained by motivation.

We tested hypothesis 5 by using hierarchical linear modeling to examine the multiplicative interaction among MAO on knowledge work. The multiplicative term between motivation and ability was computed and introduced in the regression equation as a predictor at level 3. Thus, in final model, their interaction effects (M×A: b = -0.245, SE = 0.075, p>.05; M×O: b = 0.627, SE = 0.089, p>.05; M×O×A: b = 0.356, SE = 0.234, p> 05) were entered, implying that adding interaction terms could not significantly improve the predictive power of the model ($\Delta R^2 = 0.005$).

To confirm the results, we used K-means clustering method, and the data was classified into three clusters including low-MAO, middle MAO and high-MAO. Cluster analysis is a statistical technique used to group cases into homogeneous subgroups based on responses to variables. The results revealed that the greatest extent of knowledge work performance is related to the group that simultaneously has the high amount of motivation, ability and opportunity. Also, ANOVA showed that the difference between those three groups (low-MAO, mode MAO and high-MAO) was significant (F = 82.90, df = 2). Figure 2 gives a graphical representation of comparison groups.

Table 2. The measurement model

constructs	Indicators	Items	Factor Loading	t-value	Std. Error	Composite Reliability	Average Variance Extracted (AVE)
Knowledge work	Knowledge creation	Q1	0.832	32.846	0.025	0.843	0.643
		Q2	0.768	27.826	0.028		
		Q3	0.765	18.646	0.041		
		Q4	0.691	13.322	0.052		
	Knowledge application	Q5	0.676	10.922	0.062		
		Q6	0.813	32.952	0.025		
		Q7	0.717	16.217	0.044		
		Q8	0.694	15.812	0.044		
	Knowledge sharing	Q9	0.642	4.510	0.142		
		Q10	0.741	7.307	0.101		
		Q11	0.752	13.060	0.058		
Motivation	organizational rewards	Q12	0.734	9.707	0.076	0.754	0.500
		Q13	0.804	26.550	0.030		
		Q14	0.722	15.320	0.047		
		Q15	0.889	51.624	0.017		
		Q16	0.747	12.069	0.062		
		Q17	0.834	26.923	0.031		
		Q18	0.698	7.810	0.089		
		Q19	0.729	9.661	0.075		
		Q20	0.632	6.479	0.098		
	reciprocal benefits	Q21	0.732	11.241	0.065		
		Q22	0.741	10.058	0.074		
		Q23	0.725	11.855	0.061		
	enjoyment in helping others	Q24	0.754	15.027	0.050		
		Q25	0.706	12.979	0.054		
		Q26	0.722	16.926	0.043		
		Q27	0.695	15.110	0.046		
		Q28	0.742	16.582	0.045		
	self- efficacy	Q29	0.657	12.820	0.051		
		Q30	0.671	10.873	0.062		
		Q31	0.737	17.948	0.041		
		Q32	0.671	12.064	0.056		
		Q33	0.763	26.424	0.029		
Opportunity		Q34	0.951	5.857	0.162	0.793	0.567
		Q35	0.725	3.529	0.206		
		Q36	0.422	2.682	0.251		
Ability		Q37	0.730	15.095	0.048	0.816	0.527
		Q38	0.798	25.228	0.032		
		Q39	0.710	14.078	0.050		
		Q40	0.658	12.092	0.054		

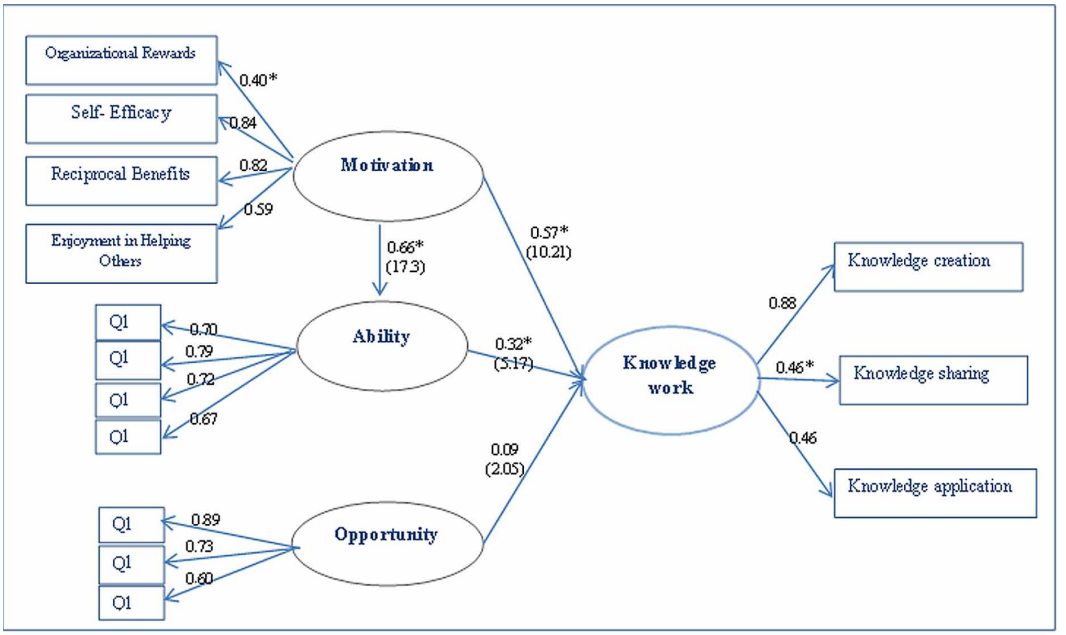
Table 3. Goodness of fit measures for the constructs of research model

constructs	χ2/df	GFI	AGFI	NFI	CFI	RMSEA
Knowledge work	245.58/87	0.93	0.96	0.93	0.91	0.082
Motivation	4745.39/1793	0.93	0.95	0.91	0.92	0.078
Opportunity	29.19/9	0.93	0.90	0.91	0.89	0.077
Ability	5.29/2	0.97	0.91	0.92	0.94	0.082

Table 4. R^2 Value, Path Coefficients and Significance Levels of the model constructs

Constructs	R^2	Path Coefficients	Std. Error	T Value	hypothesis
Motivation> KW	0.725	0.571	0.056	10.20	supported
Opportunity>KW		0.089	0.043	2.05	supported
Ability>KW		0.327	0.063	5.174	supported
Motivation>ability	0.443	0.665	0.038	17.308	supported

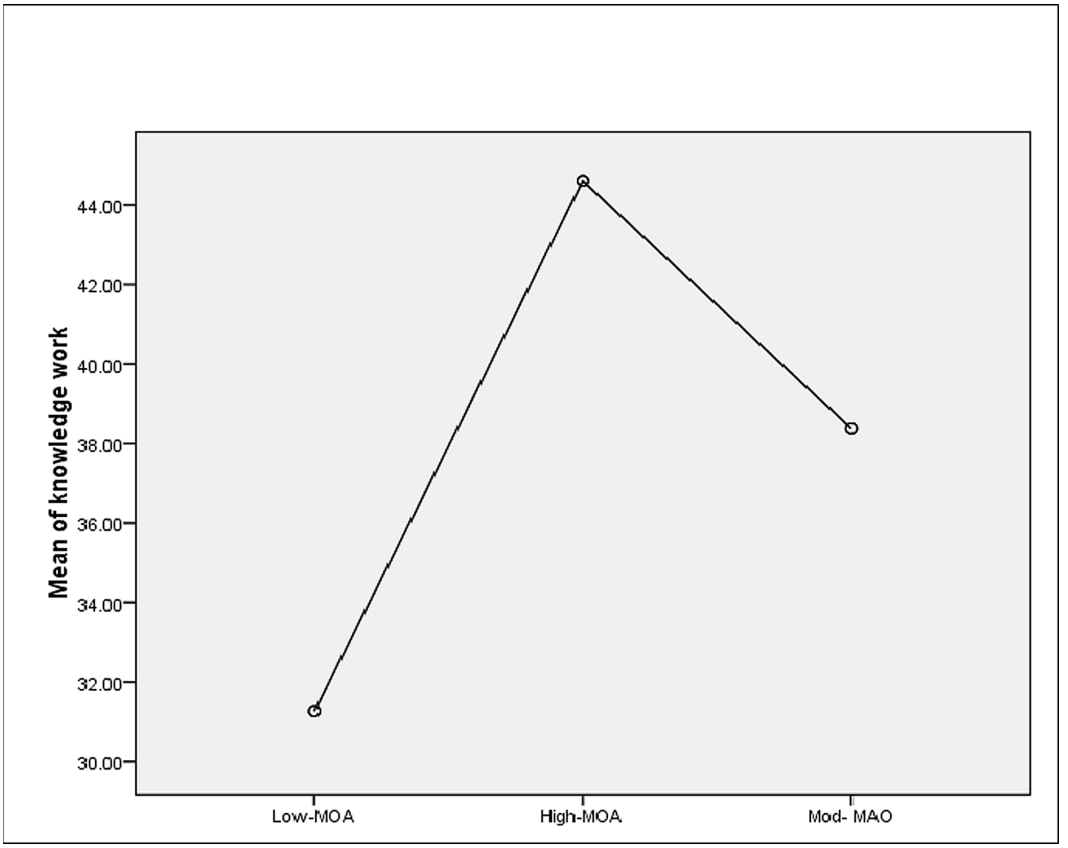
Figure 1. Path coefficients for MAO modeling to knowledge work Note: The model shows path coefficients and corresponding t-value in parentheses. *Significant at p < 0.0001



Note:

- Low-MAO (N = 45): ability (M = 12), motivation (M = 58.18) and opportunity (M = 10.38)
- Mod-MAO (N = 153): ability (M = 14.67), motivation (M = 76.99) and opportunity (M = 11)
- High-MAO (N = 151): ability (M = 17.83), motivation (M = 93) and opportunity (M = 11.61)

Figure 2. K-means Cluster analysis of MAO effect on knowledge work



DISCUSSION

The results provide strong support to the proposed hypotheses. Findings confirm that knowledge work is influenced by motivation, ability and opportunity. Our research model demonstrates good explanatory power for knowledge work, with over 0.725 of the variance explained (R^2 = 72.5%). The strongest direct determinant of knowledge work is motivation (.57 vs. .37 for ability and .09 for opportunity). The result also found that intrinsic motivators tend to be the most influential drivers in knowledge work, as compared to extrinsic motivators. This is consistent with previous findings that highlighted the crucial role of motivation, especially intrinsic motivators, in improving KM activities (e.g. Cruz et al., 2009; Lam & Lambermont-Ford, 2008; Huang et al., 2013). However, establishing the right incentives such as rewards or motivational aids to encourage people to share and apply knowledge is one of the important factors (Yew Wong, 2005). Argote et al. (2003) argued that motivation is one of the causal mechanisms to participate in KM processes. Ajmal et al. (2010) revealed that the absence of incentives for employee who engage in KM initiatives was the most significant barrier to the success KM initiatives.

Results also found that motivation has indirect effects on knowledge work. As the model showed motivation explains 44 percent of the variance in ability. Hence, it seems ability plays the role of a mediator variable between motivation and knowledge work. Consistent with Kaur (2015), motivated employees makes use of their cognitive, affective and conative abilities to achieve organizational goals. According to DW Rechberg and Syed (2014) individuals have the ability to create meaning of things, reflect and interpret situations. Several studies (e.g. Siemsen et al., 2008; Binney et al., 2006)

have also recognized the role of ability in KM outcomes. This means, individuals who possess more personal-knowledge capabilities are more effective in performing KM activities and ensuring KM success (Hussain et al., 2010).

The result also found that the time availability as opportunity to perform knowledge work activities has significant path in the model. In contrast with motivation and ability, this effect is weaker in influencing knowledge work. Contrary to Siemsen et al., (2008), Hallahan (2001), and Cleveland and Elli (2015), time availability is not the most important operational constraints.

Considering the nature of knowledge work, knowledge workers are best described as investors. They choose whether or not to invest their skills in a given company. They often have the power to resist being told what to do. Therefore, they choose to engage in knowledge work to the extent that they have the motivation, ability and opportunity to do so (Davenport, 2010; Kelloway & Barling, 2000). Moreover, results revealed that the greatest extent of knowledge work is related to the group that simultaneously has high motivation, ability and opportunity.

This study has some limitations that should be recognized to help produce higher quality research in this area. First, the research methodology is purely quantitative. This limits capturing the richness, complexity, and depth needed to understand organizational and personal constructs influencing knowledge-work effectiveness. Future qualitative research will allow deep examination of the relationships among the aforementioned variables. For example, interviews with knowledge workers can reveal many constructs that are imbedded in the organizational culture. Second, opportunity measurement was limited to time availability, while there are other measurements of opportunity that future research can consider. Third, the sample is taken from one university in Iran; therefore, the context is geographically limited and industry-specific. In order to generalize the results, further studies should be conducted at different contexts. Particularly, the national and organizational cultures might have high impact on individual constructs that affect knowledge-work activities.

IMPLICATIONS

This paper presents an empirically validated MAO framework to improving knowledge work. In this context, knowledge workers must be treated as a valuable resource, which is a view consistent with Kelloway and Barling (2000), Drucker (1998) and Davenport (2010). Knowledge work is a discretionary behavior, and knowledge workers should be viewed as investors of their intellectual capital. Their behavior is dependent on their motivation, ability and opportunity to perform knowledge-work activities.

Results demonstrated the usefulness of the MAO model in explaining knowledge work activities. Although, some researchers have focused on the role of motivation, our findings indicate that in addition to motivation, ability and opportunity have a significant influence on knowledge work behaviors. In addition, ability plays the role of a mediator variable. As stated by Yew Wong (2005: 273), "employee development is seen as a way to improve and enhance the personal value of individuals. The skills and competences of knowledge workers need to be continuously developed in order for them to produce valuable contributions to a company. If not, as with other tangible assets, their value will depreciate".

The findings focused on the success of KM practices by individuals. An important implication on human resource practices is that they should aim to help individuals to be more effective at a personal-level by enhancing their ability and motivation. As stated by Davenport and Volpel (2001), "managing knowledge is managing people; managing people is managing knowledge" (cited in Yew Wong, 2005: 212). In this regards, managers should formulate an attractive incentive package to motivate employees to engage in KM initiatives. Such an incentive system should also encourage them to perform their activities to the best of their ability. Certainly, it is important to provide opportunities for employees especially time availability for engagement in knowledge work activities.

Our study provides insights and future directions for research on knowledge work as a discretionary behavior in organization and the factors influencing it. Scholars can investigate the effect of empowerment of individuals on their tendency to knowledge-creation, knowledge-sharing and knowledge-application. Since personal-knowledge often raise the issue of knowledge ownership, further attention to ethical issues may bring valuable insights for KM in organizations.

CONCLUSION

Although previous research has suggested the existence of significant organizational and technological factors of KM success, few studies have highlighted the role of the individual and its related constructs in KM success. This paper has highlighted the impact of motivation, ability and opportunity on knowledge work. In contrast with traditional KM research, this study adopted the PKM perspective. In alignment, knowledge work is defined as a discretionary behavior that is a function of motivation, ability and opportunity - independently.

The findings of this study supported the hypotheses that employee's motivation, ability and opportunity affect knowledge-work activities. In addition, when it comes to motivation, knowledge workers are more intrinsically motivated than extrinsically when it comes to knowledge-work. Particularly, this is important as motivation has the highest impact on knowledge-work. Moreover, second in ranking, ability has a high impact on knowledge work. It is also recognized that motivation has a high correlation with ability, which indicates that motivation has also an indirect impact and ability seems to play the role of a mediator between motivation and knowledge-work. Opportunity is found to have a significant yet lesser impact on knowledge-work when compared to motivation and ability.

Improving knowledge-work by motivation, ability and opportunity requires different levels of complementarity among these three variables. As shown, the greatest extent of knowledge-work performance is related to the group that simultaneously has high levels of motivation, ability and opportunity. The contribution of this article is to provide empirical data from employees in university to illustrate how motivation, ability and opportunity can influence on knowledge-work.

ACKNOWLEDGMENT

Authors gratefully acknowledge the support from Ferdowsi University of Mashhad. This study was supported in part by vice president for research and technology at Ferdowsi University of Mashhad (Research Code: 27811). We gratefully acknowledge this support. We are thankful for the insightful comments by the editors and reviewers of this article.

REFERENCES

Ajmal, M., Helo, P., & Kekäle, T. (2010). Critical factors for knowledge management in project business. *Journal of Knowledge Management*, *14*(1), 156–168. doi:10.1108/13673271011015633

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *Management Information Systems Quarterly*, *1*(1), 107–136. doi:10.2307/3250961

Argote, L., McEvily, B., & Reagans, R. (2003). Managing Knowledge in Organizations: An Integrative Framework and Review of Emerging Themes. *Management Science*, *49*(4), 571–582. doi:10.1287/mnsc.49.4.571.14424

Basu, B., & Sengupta, K. (2007). Assessing success factors of knowledge management initiatives of academic institutions–a case of an Indian business school. *Electronic Journal of Knowledge Management*, *5*(3), 273–282.

Binney, W., Oppenheim, P., & Hall, J. (2006, January). Towards the confirmation of the MOA model: an applied approach. In *ANZMAC 2006: Advancing theory, maintaining relevance:Proceedings of the 2006 Australian and New Zealand Academy of Marketing conference* (p. 1-7). Queensland University of Technology, School of Advertising, Marketing and Public Relations.

Chang, Y. Y., Gong, Y., & Peng, M. W. (2012). Expatriate knowledge transfer, subsidiary absorptive capacity, and subsidiary performance. *Academy of Management Journal*, *55*(4), 927–948. doi:10.5465/amj.2010.0985

Chennamaneni, A., Teng, J. T., & Raja, M. K. (2012). A unified model of knowledge sharing behaviors: Theoretical development and empirical test. *Behaviour & Information Technology*, *31*(11), 1097–1115. doi:10.1080/0144929X.2011.624637

Cheong, R. K., & Tsui, E. (2011). From Skills and Competencies to Outcome-based Collaborative Work: Tracking a Decades Development of Personal Knowledge Management (PKM) Models. *Knowledge and Process Management*, *18*(3), 175–193. doi:10.1002/kpm.380

Cleveland, S., & Ellis, T. J. (2015). Rethinking knowledge sharing barriers: A content analysis of 103 studies. [IJKM]. *International Journal of Knowledge Management*, *11*(1), 28–51. doi:10.4018/IJKM.2015010102

Collins, D. (1997). Knowledge work or working knowledge? Ambiguity and confusion in the analysis of the knowledge age. *Employee Relations*, *19*(1), 38–50. doi:10.1108/01425459710163570

Cruz, N. M., Pérez, V. M., & Cantero, C. T. (2009). The influence of employee motivation on knowledge transfer. *Journal of Knowledge Management*, *13*(6), 478–490. doi:10.1108/13673270910997132

Davenport, T. H. (2010). Process management for knowledge work. In J. Vom Brocke & M. Rosemann (Eds.), *Handbook on Business Process Management* (pp. 17–35). Berlin, Heidelberg: Springer. doi:10.1007/978-3-642-00416-2_2

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Harvard Business Press.

Davis, G. B. (2002). Anytime/anyplace computing and the future of knowledge work. *Communications of the ACM*, *45*(12), 67–73. doi:10.1145/585597.585617

Drucker, P. F. (1998). Management's New Paradigms. *Forbes*, 10, 152–177.

Efimova, L. (2004). Discovering the iceberg of knowledge work: A weblog case. *Paper presented at the Fifth European Conference on Organization, Knowledge, Learning and Capabilities (OKLC '04)*, Innsbruk, Austria. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.128.9265

El-Farr, H. K. (2009). Knowledge work and workers: A critical literature review (working paper). Leeds University Business School.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *JMR, Journal of Marketing Research*, *1*(1), 39–50. doi:10.2307/3151312

Garson, G. D. (2008). *Path analysis*. from Statnotes: Topics in Multivariate Analysis. Retrieved, 9 (05).

Gumusluoglu, L., & Karakitapoglu-Aygün, Z. (2010). Bilgi Çalisanlarinin Adalet ve Güçlendirme Algilarinin Örgüte, Lidere ve Ise Baglilik Üzerindeki Etkileri. *Türk Psikoloji Dergisi*, 25, 66, 21.

Hallahan, K. (2001). Enhancing motivation, ability, and opportunity to process public relations messages. *Public Relations Review*, *26*(4), 463–480. doi:10.1016/S0363-8111(00)00059-X

Hislop, D. (2008). Conceptualizing Knowledge Work Utilizing Skill and Knowledge-based Concepts the Case of Some Consultants and Service Engineers. *Management Learning*, *35*(5), 579–596. doi:10.1177/1350507608098116

Ho, L. A. (2008). What affects organizational performance? The linking of learning and knowledge management. *Industrial Management & Data Systems*, *108*(9), 1234–1254. doi:10.1108/02635570810914919

Hoq, K. M. G., & Akter, R. (2012). Knowledge management in universities: Role of knowledge workers. *Bangladesh Journal of Library and Information Science*, *2*(1), 92–102. doi:10.3329/bjlis.v2i1.12925

Huang, M. C., Chiu, Y. P., & Lu, T. C. (2013). Knowledge governance mechanisms and repatriates knowledge sharing: The mediating roles of motivation and opportunity. *Journal of Knowledge Management*, *17*(5), 677–694. doi:10.1108/JKM-01-2013-0048

Hussain, I., Ahmed, S., & Si, S. (2010). Personal Knowledge Abilities and Knowledge Management Success. *Journal of Information and Knowledge Management*, *9*(04), 319–327. doi:10.1142/S021964921000270X

Hutchinson, S. (2013). *Performance Management Theory and Practice*. London: Chartered Institute of Personnel and Development.

Jennex, M., & Olfman, L. (2005). Assessing knowledge management success. *International Journal of Knowledge Management*, *1*(2), 33–49. doi:10.4018/jkm.2005040104

Jennex, M. E., Smolnik, S., & Croasdell, D. T. (2009). Towards a consensus knowledge management success definition. *Vine*, *39*(2), 174–188. doi:10.1108/03055720910988878

Jennex, M. E., Smolnik, S., & Croasdell, D. (2012). Where to look for knowledge management success. *Proceedings of the 2012 45th Hawaii International Conference on System Science (HICSS)* (pp. 3969-3978). IEEE.

Jiang, K., Lepak, D. P., Hu, J., & Baer, J. C. (2012). How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of Management Journal*, *55*(6), 1264–1294. doi:10.5465/amj.2011.0088

Kankanhalli, A., Tan, B. C., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: An empirical investigation. *Management Information Systems Quarterly*, 2005, 113–143.

Kaur, K. (2015). Teacher motivation: A theoretical perspective. *Indian Streams Research Journal*, *5*(2), 1–4.

Kelloway, E. K., & Barling, J. (2000). Knowledge work as organizational behavior. *International Journal of Management Reviews*, *2*(3), 287–304. doi:10.1111/1468-2370.00042

Lam, A. C. L., & Lambermont-Ford, J. P. (2008). Knowledge creation and sharing in organizational contexts: a motivation-based perspective (MPRA Paper No. 11488). University of London, Royal Holloway.

Lee, K. C., Lee, S., & Kang, I. W. (2005). KMPI: Measuring knowledge management performance. *Information & Management*, *42*(3), 469–482. doi:10.1016/j.im.2004.02.003

Leung, X. Y., & Bai, B. (2013). How motivation, opportunity, and ability impact travelers social media involvement and revisit intention. *Journal of Travel & Tourism Marketing*, *30*(1-2), 1–2, 58–77. doi:10.1080/10548408.2013.751211

Lin, H. F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2), 135-149. DOI:14510.1177/0165551506068174

Lin, H. F. (2014). Contextual factors affecting knowledge management diffusion in SMEs. *Industrial Management & Data Systems*, *114*(9), 1415–1437. doi:10.1108/IMDS-08-2014-0232

Minbaeva, D.B. (2013). Strategic HRM in building micro-foundations of organizational knowledge-based performance. *Human Resource Management Review*, 23(4), 378-390. DOI:101016201210001

Mládková, L. (2012). Leadership in management of knowledge workers. *Procedia: Social and Behavioral Sciences*, *41*, 243–250. doi:10.1016/j.sbspro.2012.04.028

Mládková, L. (2015). Knowledge Workers and the Principle of 3S (Self-Management, Self-organization, Self-control). *Procedia: Social and Behavioral Sciences*, *181*, 178–184. doi:10.1016/j.sbspro.2015.04.879

Muhammed, S., Doll, W. J., & Deng, X. (2009). A model of interrelationships among individual level knowledge management success measures. *International Journal of Knowledge Management*, *5*(1), 1–16. doi:10.4018/jkm.2009010101

North, K., & Gueldenberg, S. (Eds.). (2011). *Effective knowledge work: answers to the management challenge of the 21st century*. Emerald Group Publishing.

Okorogu, C. I. (2015). First generation meta-analytic review of the influence of human resource management single practices on organizational outcomes [Master of Business]. Auckland University of Technology. Retrieved from http://aut.researchgateway.ac.nz/handle/10292/9829

Olsen, K. M. (2016). The power of workers: Knowledge work and the power balance in Scandinavian countries. *Employee Relations*, *38*(3), 390–405. doi:10.1108/ER-10-2014-0121

Palvalin, M., Vuolle, M., Jääskeläinen, A., Laihonen, H., & Lönnqvist, A. (2015). SmartWoW–constructing a tool for knowledge work performance analysis. *International Journal of Productivity and Performance Management*, *64*(4), 479–498. doi:10.1108/IJPPM-06-2013-0122

Rao, N. J. (Ed.). (2006). *Knowledge Workers: Issues and Perspectives*. Icfai University Press.

Rechberg, DW, I., & Syed, J. (. (. (2014). Appropriation or participation of the individual in knowledge management. *Management Decision*, *52*(3), 426–445. doi:10.1108/MD-04-2013-0223

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. doi:10.1006/ceps.1999.1020 PMID:10620381

Sedighi, M., van Splunter, S., Zand, F., & Brazier, F. (2015). Evaluating Critical Success Factors Model of Knowledge Management: An Analytic Hierarchy Process (AHP) Approach. *International Journal of Knowledge Management*, *11*(3), 17–36. doi:10.4018/IJKM.2015070102

Siemsen, E., Roth, A. V., & Balasubramanian, S. (2008). How motivation, opportunity, and ability drive knowledge sharing: The constraining-factor model. *Journal of Operations Management*, *26*(3), 426-445. DOI:10,1016/j.jom.2007,09,001

Timonen, H., & Paloheimo, K. S. (2011). The Emergence and Diffusion ofthe Concept of Knowledge Work. *Leading Issues in Knowledge Management Research*, *1*.

Tsui, E. (2002). Technologies for personal and peer-to-peer (p2p) knowledge management. In CSC Leading Edge Forum Technology Grant Report.

Tuuli, M. M. (2012, July 24-26). Competing models of how motivation, opportunity and ability drive performance behaviors. In S Laryea, S.A Agyepong, R Leiringer and W Hughes (Eds.), *Procs 4th West Africa Built Environment Research (WABER) Conference*, Abuja, Nigeria (pp. 1359-1366).

Widmann, B. S. (2013). Influence of leadership style on work engagement of knowledge workers in an engineering organization [Doctoral thesis]. Indiana Wesleyan University, Indiana. Retrieved from http://pqdtopen.proquest.com/doc/1428738809.html?FMT = ABS

Wright, K. (2005). Personal knowledge management: Supporting individual knowledge worker performance. *Knowledge Management Research & Practice*, *3*(3), 156–165. doi:10.1057/palgrave.kmrp.8500061

Yew Wong, K. (2005). Critical success factors for implementing knowledge management in small and medium enterprises. *Industrial Management & Data Systems*, *105*(3), 261–279. doi:10.1108/02635570510590101

Rezvan Hosseingholizadeh, Ph.D, is Assistant Professor of Educational Administration and Knowledge Management at the Department of Education at Ferdowsi University of Mashhad, Mashhad, Iran. She completed her Ph.D degree in Educational Administration from University of Teharn, Teharan, Iran. Her current research interests include knowledge management and educational administration and leadership. Besides publishing several articles about knowledge management in Persian, she is teaching knowledge management courses in M.A. and Ph.D at FUM. Rezvan Hosseingholizadeh can be contacted at: rhgholizadeh@um.ac.ir

Somayyeh Ebrahimi Koushk Mahdi is currently an educational administration Ph.D student in the Department of Education at Ferdowsi University of Mashhad, Mashhad, Iran. Somayyeh's current research interests include educational management and leadership theory, knowledge management, E-learning, besides publishing several articles about E-learning & Knowledge management.

Hadi El-Farr is a faculty member of Human Resources at the Human Resource Department, School of Management and Labor Relations, Rutgers University, United States of America. He completed his Ph.D. in Human Resource Management from the University of Leeds, United Kingdom. His current research interest is KM and the impact of human resource management practices on effective KM activities.