

An Empirical Study on the Antecedents of Knowledge Hiding Behavior

Nara Im, Hojin Bang

Department of Management, Jeju National University, Republic of Korea
nara3110@jejunu.ac.kr, hojinbang@jejunu.ac.kr (corresponding author)

Abstract. The significance of knowledge management to ensure an agile response to the rapidly changing technological environment and the technological superiority of the organization is continuously emphasized, as the critical factor for the survival of organizations is focused on adapting to and leading a new technological environment. Most studies about knowledge management in organizations have focused on antecedents of knowledge-sharing behavior rather than knowledge-manipulation or hiding behaviors. Therefore, our attention was drawn to the issue of 'how to minimize knowledge hiding behavior among members?' rather than 'how to maximize knowledge sharing among members?'. We made the presumption that there are motivational factors and hygienic factors in information exchange mechanisms based on a review of the literature on knowledge management research. Additionally, we hypothesized that inclusive leadership and perceived organizational politics may have a big impact on employees' knowledge-hibernation tendencies. Furthermore, we established a mediation relationship between these factors and team commitment and prosocial employee motivation. We used structural equation modeling to test our research model statistically using 445 data from Korean business organizations. The outcome demonstrates that all coefficients—aside from two paths—were statistically significant. We examine the practical implications for minimizing these bad features of knowledge hiding behaviors as well as the implications for future studies on the negative side of knowledge exchange behaviors, such as knowledge concealing or manipulating behavior.

Keywords: knowledge hiding behavior, perceived organizational politics, inclusive leadership, pro-social motivation, commitment to team

1. Introduction

The 4th industrial revolution is hitting the global business environment with COVID19. With the development of new game-changing technologies such as artificial intelligence and big data, global business is facing a dramatic transition to the whole world. Rapid changes in the environment have a profound impact on the industry and business environment, and business organizations are standing at the crossroads of natural selection and survival discussed in organizational ecology (Hannan and Freeman 1984).

In order to acquire and maintain organizations' sustainable competitive advantage in rapid changing environment, organizations have given the topic of knowledge management considerable attention. They did so in order to create learning organizations as well as to ensure technological supremacy for their operations.

Knowledge management, which has been studied by numerous researchers since the 1980s, is not a newly introduced management concept, but the essence of knowledge management - diffusion and creation of knowledge - is still valid for modern companies as a key factor for responding to drastic environmental changes.

The core of knowledge management is to facilitate the creation and diffusion of new knowledge within the organization (Nonaka and Takeuchi 1995). Knowledge management is defined as an organizational system that creates knowledge and induces diffusion within the organization in order to maintain organizational competitiveness and achieve organizational objectives (Chong and Besharati 2014). Knowledge has a higher value than other resources in the organization. Because knowledge management practices require considerable attention and effort since their effects take time to develop and are a socially complicated process, they cannot be implemented instantaneously. The main concept of knowledge management is a comprehensive system that enables knowledge-based management activities by effectively acquiring knowledge at the individual and organizational level, efficiently sharing it with other members, and accumulating it systematically within the organization. In the rapidly changing business environment, knowledge management can be understood as a key survival factor of an organization.

As knowledge sharing has been pointed out as a key variable related to organizational effectiveness, numerous studies on knowledge-sharing behavior of members have been suggested as a factor to secure the organization's competitiveness to respond to the environmental transformation. However, theory and reality always go separate. We could see instances where important information needed for work is purposely withheld, delayed in sharing, or even twisted.

Numerous researches have focused on the search for antecedent variables that encourage information sharing, but little has been done to look into the negative aspects of the process, such as knowledge manipulation or knowledge concealment.

In this study, we focus on 'how to minimize knowledge hiding behavior between members?' rather than 'how to maximize knowledge sharing among members?'.

2. Literature Review and Hypotheses

2.1. Knowledge hiding behavior

Behaviors such as sharing, transfer, and diffusion of knowledge are defined as typical kinds of social exchange behaviors based on the social relationships of members (Rhee and Choi 2014). Knowledge exchange behavior can be understood as a one-on-one (dyadic) relationship between members requesting knowledge and the members providing it. Knowledge exchange behavior consists of knowledge sharing, knowledge hiding, and knowledge manipulation behavior.

Knowledge sharing refers to activities aimed at strengthening organizational capabilities by maximizing the use of knowledge by sharing knowledge assets possessed by organizations and individuals within the organization (Gupta and Govindarajan 2000). Knowledge sharing is the dyadic flow of mutual knowledge between the knowledge sharer and the beneficiary. It is an activity that enhances the organizational effectiveness of the company.

Knowledge sharing is the most essential element of knowledge management, and like knowledge creation, it is a basic element for securing an organization's competitive advantage. Knowledge sharing usually depends on an individual's pro-social desire to share his or her knowledge with others, and it appears as a form of interaction that affects the performance of individuals and groups. Therefore, the process of knowledge sharing can be understood not as a mechanical and automatic process, but as a multi-dimensional mechanism in which individual motives, attitudes, and relationships of interaction act in a socially complex way.

As discussed above, most researchers agree on the positive effect of knowledge sharing, but most of the members of the organization may perceive their knowledge and information as their most valuable assets and may show an attitude that they do not want to share it with others. It is pointed out that knowledge sharing is not a natural phenomenon within an organization (Liu et al., 2012). There can be numerous obstacles that prevent knowledge sharing within an organization. There are possibilities that knowledge workers are less inclined to share their knowledge with others because they recognize their knowledge as a key factor for personal growth and competitiveness (Bock et al., 2005).

In fact, members of an organization are not assets owned by the organization, and intellectual assets within the organization are not owned by the organization as well. Accordingly, an organization cannot force its members to share an individual's intellectual property (information) with others (Kelloway and Barling 2000). Therefore, many efforts to promote knowledge sharing are failing (Hislop 2002), and even if an explicit reward for knowledge sharing is provided to organizational

members, resistance to knowledge sharing often still exists (Bock et al., 2005; Joachim 2022).

According to Connelly et al., (2012), a representative study on knowledge hiding behaviors, knowledge hiding behaviors are defined as intentional behaviors that intentionally hide or not convey the knowledge needed to other members. Knowledge hiding behavior is potentially related to some similar variables such as knowledge hoarding, knowledge sharing, counterproductive workplace behavior, workplace aggression, and incivility. But knowledge hiding behavior is clearly distinct concept from those similar behaviors.

Prior research on knowledge hiding behavior is very scarce, but relatively many studies have been conducted on the obstacles to knowledge sharing behavior. In the study of Barson et al., 2000, the barriers to knowledge sharing were divided into human barriers, organizational barriers, and technological barriers. Similarly, Chong and Besharati (2014) suggested personal, organizational, and technical factors as obstacles to knowledge sharing. Lilleore and Hansen (2011) suggested obstacles for knowledge sharing such as large physical distance between colleagues, reluctance to reveal one's own know-how in the process of knowledge sharing, and recognition of knowledge as a very important source of individual power. Therefore, researchers should have interests in the antecedent factors of knowledge hiding as hygiene factors for motivating the knowledge transition process.

2.2. Inclusive leadership

As leadership was emphasized in the social relationship between leaders and members, a few researchers paid attention to inclusive leadership or leaders' inclusive behavior nowadays. The concept of inclusive leadership was proposed by [16]. Inclusive leadership focuses on the inclusiveness of the leader, such as the behaviors of the leader accepting and appreciating the diverse opinions of members. Inclusive leadership is defined as leaders commit to ensuring all team members are treated equitably, feel a sense of belonging and value, and have the resources and support they need to achieve their full potential (Nembhard and Edmondson 2006).

According to previous research on inclusive leadership, the characteristics of inclusive leadership can be summarized as follows. First, inclusive leadership listens to members' opinions through openness, usefulness, and accessibility, and provides encouragement and guidance when members make mistakes. Second, inclusive leadership instills awareness among members that leaders can be actively used and maintains open communication with members (Nembhard and Edmondson 2006). Third, an inclusive leader encourages members of the organization to participate as much as possible in the decision-making process, tries to understand all members on an equal footing, and tries to act for them. Fourth, inclusive leaders support members to demonstrate their abilities within the organization. These inclusive leaders can

minimize members' anxiety, uncertainty, and role stress through supportive behavior toward their members, and reinforce members' commitment to the organization.

In this study, we predicted that the inclusive behavior of leaders will have a positive effect on minimizing or resolving problems caused by distrust and low-level social relationships within the organization, which are pointed out as a precursor to organizational members' knowledge-hiding behavior. In other words, when inclusive leadership is exercised, positive attitudes and atmospheres are formed among members of the organization, which can be expected to have the effect of weakening the negative intention to exhibit knowledge hiding behavior within the organization. Based on this discussion, the following [H1] was derived.

H1: Inclusive leadership will decrease knowledge hiding behaviors of employees

2.3. Perception of organizational politics

Another variable predicted to affect the knowledge hiding behavior of members in this study is the perception of organizational politics. Organizational politics has been noted as important organizational attribute related to association, power, social networks, decision-making, social influence strategies, teams, and management. Although academic interest in organizational politics has rapidly increased, each researcher has a different emphases and different perspectives on their purpose of research. So, there is not enough agreement on the concept of organizational politics [17].

When members of an organization perceive that organization has political characteristics and depends on political decision-making rather than objective and reliable decision-making, they are not willing to give their important knowledge and information to others without any incentives to them. It can be linked to the perception that those efforts may be detrimental or risky to the individual. Based on the results of this review, we predicted that the more members perceive the organization as political, the more conservatively they recognize their own important knowledge. Based on this discussion, the following [H2] was derived.

H2: Perception of organizational politics will decrease knowledge hiding behaviors of employees

2.4. Commitment to team

Recently, organization members' commitment to the department and team is pointed out as a more significant organizational effectiveness variable compared to the commitment to the entire organization. Bishop and Scott (1997) identified that team commitment is a different variable from organizational commitment. This study shows that interpersonal conflict and satisfaction with team members have a great influence on team commitment, while conflict with job resources and satisfaction with superiors are related to organizational commitment.

Commitment to a team is defined as ‘the strength of team members’ sense of unity and belonging to the team’ (Bishop and Scott 1997; Wee et al., 2020). In other words, commitment to the team is the degree to which they have a sense of belonging to their team's duties, colleagues, and superiors. According to prior discussion on the effect of team commitment, this study examines the mediating role of team commitment in the relationship among knowledge hiding behavior, inclusive leader behavior, and perception of organizational politics.

H3: Commitment to team will mediate the relationship between inclusive leadership and knowledge hiding behaviors of employees

H4: Commitment to team will mediate the relationship between perception of organizational politics and knowledge hiding behaviors of employees

2.5. Prosocial motive

Prosocial motive refers to members’ psychological state in which they want to provide beneficial help to others or groups (Grant, 2007). Prosocial motive is also related to the behavior of making efforts to solve organizational problems in order to provide good results for others. When pro-social motivation is high, even if there is some sacrifice or cost to oneself, organizational members’ desire to be beneficial to colleagues and make more efforts for altruistic behavior. In other words, they place value on the altruistic action itself and see it as accomplishing their goals through the favorable results that come as a result of it, rather than anticipating reward for their own actions. Prosocial motivation can be expressed from an individual's internal state, but it can also be expressed from situational factors.

Prosocial motivation has been continuously studied as a major variable that affects the voluntary behavior of members within an organization. According to the review on prosocial motivation, this study examines prosocial motives as one of the antecedent variables that minimize members' knowledge hiding behaviors and further activate knowledge sharing behaviors. It is expected to mediate the relationship among inclusive leadership, perception of organizational politics, and knowledge hiding behavior.

H5: Pro-social motive will mediate the relationship between inclusive leadership and knowledge hiding behaviors of employees

H6: Pro-social motive will mediate the relationship between perception of organizational politics and knowledge hiding behaviors of employees

2.6. Research model

Based on the research hypothesis of this study, the following research model was developed.

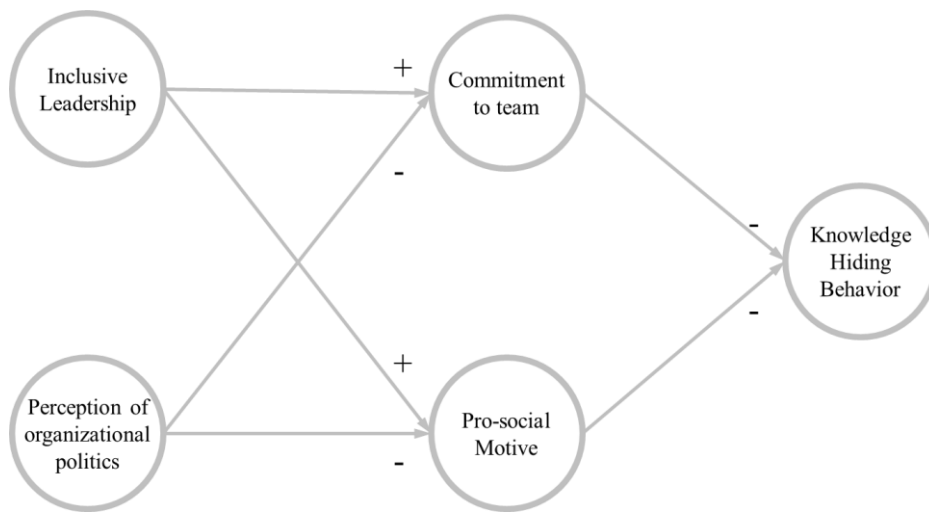


Fig. 1: Research model.

3. Measures

3.1. Knowledge hiding behavior

Knowledge hiding behavior is defined as “an intentional attempt by an individual to withhold or conceal knowledge that has been requested by another person” (Barson et al., 2000).

The measurement for knowledge hiding behavior consists of 12 questions developed by the study of Barson et al., (2000). Knowledge hiding behavior is divided into three sub-factors: playing dumb, evasive hiding, and rationalized hiding. Playing dumb is an act of intentionally pretending not to know about the knowledge when another member is asked for it. Evasive hiding is providing information that may lead to incorrect results or intentionally inaccurate information provided by the knowledge provider. Rationalized hiding means such behaviors that he/she said that it is impossible to provide the information for reasons of confidentiality, or that it is difficult to provide information due to a request from such a supervisor or other organization.

In the case of rationalized hiding, it is difficult to share knowledge with others, even if there is no intention to deceive. Representative measurement items are “I agreed to help him / her but never really intended to” and “I pretended that I did not know the information”, and all of the measurement items used in this study are Likert-type 5 points scales.

3.2. Inclusive leadership

Inclusive leadership was defined as behaviors that increase accessibility to leaders while leaders act openly to communicate without barriers with members (involving

modeling openness and providing accessibility in interactions with followers) (Nembhard and Edmondson 2006).

In order to measure inclusive leadership, 9 measurement items developed in the study of Nembhard and Edmondson (2006) were used, and representative measurement items are “My boss is open to new ideas” and “My boss is open to new ways to achieve goals.” Always seeking.”

3.3. Perception of organizational politics

In this study, organizational political perception was defined as the perception of the degree to which organizational members are connected to their work environment with organizational political relationships, and consequently, unfair situations occur. This concept of organizational politics perception was applied to a microscopic view, which is mainly dealt with in the field of organizational behavior theory, among macro and micro views on organizational politics.

In order to measure the perception of organizational politics, we used 9 items developed in the study of Kakmar and Ferris (1991). Representative measurement items are “People in our organization try to elevate themselves by lowering other people” and “Our organization does not raise questions about things that have already been decided”.

3.4. Commitment to team

In this study, team commitment is defined as an individual's strong trust and acceptance of the team's goal and the desire to belong to the team (Bishop and Scott 1997). 7 questions developed in the study of Bishop and Scott (1997) was used to measure team commitment. Representative measurement items are “I am ready to do additional work if it helps my team” and “I feel comfortable when I am with my teammates”.

3.5. Prosocial motive

Prosocial motivation is defined as the desire to make additional efforts for others and to pursue the interests of others (Grant 2007). 5 questions developed in the study of Grant (2007) were used to measure prosocial motive. Representative measurement items are “I feel it is important to help people in need” and “I believe that I should be polite to others”.

3.6. Data-gathering

In this study, data were collected from organizational members of companies located in Seoul, Busan, Gyeongnam, and Jeju in Korea. The industry was constructed targeting workers in various industries such as finance, manufacturing, distribution, and service. Variables about organizational characteristics were set as control variables along with previous studies. Respondents' gender, age, position, job group, organization size, and tenure were included as control variables. In addition, by

recognizing the social context between superiors and subordinates and considering the time required to form a relationship, the subjects included were those who had worked at the current organization for at least 3 months.

As for gathering data, the researcher visited the target company, explained the research purpose and data collection method to the survey applicant within the company, and distributed the questionnaire. On the cover of each questionnaire, the subject of this study, the purpose of the survey, and the response method were announced in the form of a guide.

The survey period was from June 30 to August 15, 2021, and it was targeted at the team and members who had served with the boss for at least 3 months. A total of 600 questionnaires were distributed at the beginning of the survey, and 445 questionnaires were collected, resulting in a response rate of 74.2%.

A total of 445 responses showed the workforce composition of men (220 people, 49.4%) and women (225 people, 50.6%) and the characteristics of respondents with an average age of 44.5. 62 people (13.9%) were working at large companies with 1,000 or more employees, and 257 people (57.8%) were working at companies with fewer than 100 employees.

3.7. Descriptive statistics

The mean, standard deviation, and correlation coefficient values of all variables included in this research model are presented in <Table-1> below. At the same time, Cronbach's α value was included as a review index to confirm the reliability of the measurement items for the variables (the value of diagonal brackets in the table).

Table 1: Descriptive statistics and correlations.

Variables	M	SD	(1)	(2)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Gender	1.5 1	.50 1									
Age	44. 49	12. 93	-.0 28								
Tenure	7.6 8	7.1 9	-.0 46	.41 3**							
Inclusive Leadership	3.3 2	.84	-.0 05	-.0 18	-.0 91	(.94)					
Perception of Organizational Politics	3.0 8	.79	-.0 48	-.0 26	.05 6	-.34 6**	(.9 1)				
Commitment to Team	3.4 6	.62	-.0 61	.18 3**	.10 0*	.557 **	-.1 77*	(.87)			
Pro-social Motivation	3.7 1	.53	-.1 11 *	.13 5**	.08 9	.295 **	-.0 38	.577 **	(.89)		

Knowledge Hiding (Rational)	2.48	.89	-0.68	-0.49	.005	-0.080	.233**	-.203**	-.138**	(.94)	
Knowledge Hiding (Intentional)	2.13	.81	-0.48	-0.98*	-.004	-.163**	.242**	-.285**	-.235**	.653**	(.91)

* $p < 0.05$, ** $p < 0.01$ (two-sided)

Every reliability coefficient (Cronbach’s alpha) for the measurement tool is 0.87 or higher, and it is interpreted that the level of reliability for the measurement tool is statistically appropriate.

3.8. Hypotheses test

As a result of the confirmatory factor analysis, the overall model fit was confirmed to be at a level that allowed the analysis to proceed ($\chi^2 = 2699.142^{**}$, $\chi^2/df = 2.649$, $RMR = 0.052$, $TLI(NNFI) = 0.897$, $CFI = 0.904$, $RMSEA = 0.061$). The coefficient of determination of all measurement indicators was confirmed to be at a statistically significant level. When the Composite Reliability (CR) and average mean-variance extraction (AVE) values were tested to check the convergent validity and discriminant validity of the measurement tool, the composite reliability results were both 0.9 or higher, and even in the case of the mean-variance extraction, the correlation coefficient between variables. It is confirmed that discriminant validity was secured because all of AVE was larger than the square value of 0.577.

In order to test the research model based on the research hypothesis of this study, the structural model of the structural equation model was established and tested statistically.

Table 2: Result of structural equation modeling.

Paths				Path Coefficients				Total Effect	
				Unstandardized Coefficients	Standardized Coefficients	Standard Error	C.R.	Direct	Indirect
Direct Effect	Inclusive Leadership	→	Commitment to Team	.334**	.621	.034	9.946	.621**	
	Inclusive Leadership	→	Pro-social Motive	.202**	.360	.032	6.356	.360**	
	Perception of Organizational Politics	→	Commitment to Team	.023	.038	.029	.800	.038	
	Perception of Organizational Politics	→	Pro-social Motive	-.070*	-.120	.034	2.347	-.120*	
	Commitment to Team	→	Knowledge Hiding (intentional)	-.418**	-.308	.075	-5.557	-.308**	
	Commitment to Team	→	Knowledge Hiding (rational)	-.362**	-.251	.080	-4.515	-.251**	
	Pro-social Motive	→	Knowledge Hiding (intentional)	-.133*	-.097	.065	-2.335	-.097*	
	Pro-social Motive	→	Knowledge Hiding (rational)	-.014	-.010	.072	-1.199	-.010	
Indirect Effect	Inclusive Leadership	→	Knowledge Hiding (intentional)						-.223**
	Inclusive Leadership	→	Knowledge Hiding (rational)						-.160**
	Perception of Organizational Politics	→	Knowledge Hiding (intentional)						-.090*
	Perception of Organizational Politics	→	Knowledge Hiding (rational)						-.011
Model Fitness				$\chi^2 = 3,077.680$ df=1,025 (p<.01) $\chi^2/df = 3.00$, RMR = .099, NNFI(TLI) = .891, RMSEA=0.067 (LO 90=0.064, HI 90=0.070)					

As a result of structural equation modeling, both the direct and indirect effect of inclusive leadership on the knowledge hiding behavior (intentional and rational) were found to be significant. There was a statistically significant effect on the prosocial motive of perception of organizational politics ($p < .05$), but the effect of perception of organizational politics on team commitment was not statistically significant. All of the direct effects of team commitment on knowledge hiding behavior were statistically significant, but the direct effect of prosocial motive on knowledge hiding behavior was significant only on intentional knowledge hiding ($p < .05$) and insignificant to rational hiding behavior. Similarly, in the analysis of the indirect effect on knowledge hiding behavior of perception of organizational politics, a significant indirect effect was shown for intentional knowledge hiding behavior ($p < .05$), but no statistically significant indirect effect was found for rational knowledge hiding behavior.

4. Conclusions

This study started from a research problem that seeks the antecedent factors for knowledge hiding behaviors rather than knowledge sharing of members. As a result of the structural equation modeling and statistical analysis of the research model, the relationships suggested in most research hypotheses were found to be statistically significant, but the direct effect of perception of organizational politics on team commitment and prosocial motivation on rational hiding behavior was not statistically significant. Moreover, it was found that the indirect effect of perception of organizational politics on rational knowledge hiding behavior was not statistically significant. In other words, the hypothesis that team commitment would decrease if members' political perceptions of the organization were high was rejected, or it may be interpreted as a result that political perception itself may not necessarily accompany negative evaluations and emotions, such as the discussion of political perception from a macro perspective.

The theoretical implications that can be suggested from this study are as follows. First, this study broadened the understanding of knowledge hiding behavior that hinders the transfer and diffusion of knowledge within the organization and explored the factors affecting it. Second, the antecedent variables that can affect knowledge hiding behavior were identified through empirical analysis. Inclusive leadership was reviewed as a characteristic of leadership that can lower the negative attitudes and perceptions involved in knowledge hiding behavior, and perception of organizational politics that can increase the cost and risk of one's knowledge-sharing behavior were reviewed. The effect on the hiding behavior was confirmed statistically. For the development of knowledge hiding behaviors in the future, it was possible to present a basic basis for examining variables at the organizational, group, and individual levels.

Despite the implications of this study, this study has the following limitations. First, since all measurement tools for measuring the variables included in the research model depend on each member's self-response questionnaire, it may represent a serious problem of common method bias. However, factor analysis to examine the discriminant validity of the measurement tool and a single factor test through factor analysis were performed to minimize this.

Second, the knowledge hiding behavior of members can be measured more reliably by the evaluation of colleagues or superiors rather than the self-report questionnaire, nonetheless knowledge hiding behavior is also assessed using the self-report questionnaire in this study.

Acknowledgments

This Research was supported by the 2021 scientific promotion program funded by Jeju National University.

References

- Barson, R. J., Foster, G., Thomas Struck, S. R., Kulwant Pawar, F. W., & Wunram, M. (2000). Inter-and intra-organisational barriers to sharing knowledge in the extended. *E-business: Key Issues, Applications and Technologies*, 367.
- Bishop, J. W. & Scott, K. D. (1997). How commitment affects team performance. *Hr Magazine*, 42, 107-112.
- Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS quarterly*, 87-111.
- Chong, C. W. & Besharati, J. (2014). Challenges of knowledge sharing in the petrochemical industry, Knowledge Management & E-Learning. *An International Journal*, 6(2), 171-187.
- Connelly, C. E., Zweig, D., Webster, J., & Trougakos, J. P. (2012). Knowledge hiding in organizations. *Journal of Organizational Behavior*, 33(1), 64-88.
- Ferris, G. R., Brand, J. F., Brand, S., Rowland, K. M., Gilmore, D. C., King, T. R., & Burton, C. A. (1993). Politics and control in organizations. *Advances in group processes*, 10, 83-111.
- Grant, A. M. (2007). Relational job design and the motivation to make a prosocial difference. *Academy of Management Review*, 32(2), 393-417.
- Gupta, A. K. & Govindarajan, V. (2000). Knowledge flows within multinational corporations. *Strategic Management Journal*, 21(4), 473-496.

Hannan, M. T. & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 149-164.

Hislop, D. (2002). Mission impossible? Communicating and sharing knowledge via information technology. *Journal of Information Technology*, 17(3), 165-177.

Joachim, J. J. (2022). Embedding large-scale information technology into the organization's work systems. *International Journal of Smart Business and Technology*, Mar., 10(1), 41-62, DOI: 10.21742/IJSBT.2022.10.1.04.

Kacmar, K. M. & Ferris, G. R. (1991). Perceptions of organizational politics scale (POPS): Development and construct validation. *Educational and Psychological Measurement*, 51(1), 193-205.

Kelloway, E. K. & Barling, J. (2000). Knowledge work as organizational behavior, *International journal of management reviews*, 2(3), 287-304.

Lilleoere, A. M. & Hansen, E. H. (2011). Knowledge-sharing enablers and barriers in pharmaceutical research and development. *Journal of knowledge management*, 15(1), 53-70.

Liu, H. C., Liu, L., Lin, Q. L., & Liu, N. (2012). Knowledge acquisition and representation using fuzzy evidential reasoning and dynamic adaptive fuzzy Petri nets. *IEEE transactions on cybernetics*, 43(3), 1059-1072.

Nembhard, I. M. & Edmondson, A. C. (2006). Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 27(7), 941-966.

Nonaka, I. & Takeuchi, H. (1995). *The Knowledge Creating*, New York, 304.

Rhee, H. Y. & Choi, K. (2014). Development and implementation of science and technology ethics education program for prospective science teachers. *Science & Education*, 23(5), 1101-1130.

Riege, A. (2005). Three-dozen knowledge-sharing barriers managers must consider. *Journal of knowledge management*. 10(1), 73-110.

Wee, K. -H, Bang, W. -S., Park, J.-Y. (2020). A Study on effect relationships of coaching leadership job satisfaction, organizational commitment, turnover intention. *International Journal of Social Welfare Promotion and Management*, Apr., 7(1), 1-8, DOI: 10.21742/IJSWPM.2020.7.1.01.