

Knowledge Management of State Universities in the Philippines

Rainer Roldan Fiscal

Laguna State Polytechnic University, Philippines
rainer.fiscal@lspu.edu.ph

**Asia Pacific Journal of
Multidisciplinary Research**

Vol. 7 No.1, 33-41

February 2019

P-ISSN 2350-7756

E-ISSN 2350-8442

www.apjmr.com

CHED Recognized Journal

ASEAN Citation Index

Date Received: October 15, 2018; Date Revised: January 20, 2019

Abstract – Higher Education Institutions (HEIs) play a vital role in generating, transmitting, disseminating, and applying knowledge. HEIs should always play its role and function based on the knowledge generated, stored, shared, and applied. This study was conducted to determine the levels of Knowledge Management (KM) Practices on the Key Factors of KM and KM Processes; and KM Performance Outcomes of State Universities. Specifically, it aims to establish the relations between the Key Factors of KM and KM Processes; and KM Processes and KM Performance Outcomes. Descriptive correlational design was used in this study and utilized purposive, stratified, quota, and random sampling techniques. The respondents of this study were the fifty faculty members and staff of the three State Universities with Level IV status and designated as Center of Excellence in Teacher Education. Questionnaire and interview were used to gather data. The study revealed that the levels of KM Practices of the three State Universities on the Key Factors of KM: Organizational Culture, Leadership, Information Technology, and Employee Motivation were very often true. The levels of KM Practices of the three public HEIs on KM Processes: Knowledge Generation, Storage, Sharing, and Application were also very often true. The levels of KM Performance Outcomes of the three public HEIs in terms of Teaching, Research, Citations, International Outlook, and Industry Income were very good. Furthermore, the study established relations between the levels of KM Practices on the Key Factors of KM and KM Processes and KM Processes and KM Performance Outcomes. Key Factors of KM influence KM Processes and KM Processes influence KM Performance Outcomes.

Keywords – Knowledge Management (KM), Practices, Processes, Performance Outcomes, State Universities.

INTRODUCTION

Scientific publication is one of the most commonly used indicators for scientific output. The number of scientific articles published in peer-reviewed journals is reflective of the amount of new knowledge generated in the country. UNESCO Science report made use of Thomson Reuters' Science Citation Index as a tool for assessing knowledge generation. Unfortunately, the number of published research articles in the Philippines is significantly lower than those of the other countries around the globe [1] even though the Philippines is the third country with the largest number of HEIs in Asia [2].

The Commission on Higher Education or CHED, the government agency that oversees Higher Education in the Philippines mandated HEIs to generate, transmit, disseminate and apply knowledge through Knowledge Management (KM). HEIs are the major component of the country's research and innovation system [3]. The CHED expected higher education institutions to help develop the nation through conducting and

disseminating research findings. Since the primary role of the higher education institutions is to generate new scientific knowledge through publication of research outputs, institutions of higher learning should focus on conducting and disseminating research outputs so that the nation and its economy will not be put at risk [4]. In spite of it KM in the Philippines is not available in the literature. Hence, KM practices of different universities in the country have been studied.

Higher Education Institutions (HEIs) play a vital role in generating, transmitting, disseminating and applying knowledge to students, faculty and staff, and industry [5]. HEIs as a knowledge-based organization should always play its role and function based on the knowledge agenda [6]. The function of HEIs from teaching, research, and service [7],[1] has been changed, scrutinized and challenged by the public to innovate and disseminate knowledge [8]. In order to answer the challenge, KM processes [9], systems [10],[11], strategies [12], approaches [13], practices

[14], methods [15] and models [16]-[18] have been implemented by universities all over the world.

The purpose of KM implementation in HEIs is to respond to globalization or global integration [19]. Specific goals of KM implementation as identified by Mohayidin et al. [8] are to do research, teaching, utilization of knowledge for better decision making and exploitation to increase the level of knowledge dissemination, and utilization of knowledge for a qualitative change in the educational process.

KM in today's world of the knowledge economy is the strategy which organizations adopt in able to survive [18]. As Ridzuan and Sam [20] stated, KM is one of the key factors to succeed in an organization, and it is not only important in business but also in education. HEIs are considered as the major center of production and dissemination of knowledge where innovation and knowledge production are the most important functions [21]. KM is the deliberation and coordination of an organization's people, technology, processes, and organizational structure to add value through reuse and innovation in a systematic way [22].

To be able to produce and disseminate knowledge, HEIs around the globe have implemented KM. Different universities adopt knowledge management models such as Mohayidin et al. [8] KM model, Bhusry and Ranjan [17] KM model, Yeh [11] KM model, and Ojo [18] KM model. The authors found out that the implementation of KM models yielded more benefits in improving the quality of knowledge production and dissemination.

OBJECTIVES OF THE STUDY

This study was conducted to determine the levels of Knowledge Management (KM) Practices on the Key Factors of KM and KM Processes; and KM Performance Outcomes of State Universities. Specifically, it aims to establish the relations between the Key Factors of KM and KM Processes; and KM Processes and KM Performance Outcomes.

METHODS

Research Design

A descriptive correlational design was employed in this study to describe the levels of KM Practices of three State Universities on the Key Factors of KM and KM Processes and KM Performance Outcomes to examine the relationship between and among them.

Subject of the Study

Based on the report of CHED (2018) there are only twenty SUC's Level IV in the country out of one-

hundred eleven [23]. CHED (2016) also reported that there are thirty-six designated Centers of Excellence and thirty-eight designated Centers of Development in Teacher Education programs all over the Philippines [24]. The subject of study was the three State Universities in the Philippines from Luzon, Visayas, and Mindanao with Level IV status and designated as Center of Excellence in Teacher Education.

This study was conducted in three State Universities in the Philippines. The first institution was located in Iloilo Province, situated in Visayas. The university offers primarily different types of programs such as medicine, nursing, education, agriculture and forestry, arts and sciences, business and management, communication, and information and communication technology. The university was designated by CHED as center of excellence in teacher education and centers of development in nursing, agriculture, and forestry. The second institution was located in Ilocos Region, situated in Luzon. The university offers different programs in medicine, law, agriculture and forestry, fisheries, engineering, education, business and arts and sciences. The university was designated by CHED as center of excellence in teacher education and centers of development in agriculture, forestry, biology, and information technology. The third institution was located in Davao, situated in Mindanao. The university offers different programs in education, engineering, business, economics, information technology, agriculture and forestry, and arts and sciences. The university was designated by CHED as centers of excellence in teacher education and agriculture and centers of development in English, forestry, and information technology.

Respondents of the Study

In total, 150 faculty members from the three State Universities participated in the study. In each university, fifty faculty members and staff with five years and above work experience in the university and with a strong connection in instruction, research, and extension were considered as the respondents of the study.

Sampling Techniques

This study utilized purposive, stratified, quota, and random sampling techniques. Purposive and stratified were used in selecting State Universities in the Philippines. Furthermore, quota and random sampling were used in selecting respondents in each State Universities.

Research Procedure

To achieve the objectives of this study, the researcher adopted the quantitative technique through a survey using questionnaire and interview method in gathering or collecting data. Respondents were asked to evaluate the levels of KM Practices on the Key Factors of KM including Organizational Culture, Leadership, Information Technology, and Employee Motivation; KM Practices on KM Processes including Knowledge Generation, Storage, Sharing, and Application; and levels of KM Performance Outcomes using a seven-point Likert-type scale.

The survey sample consisted of 50 faculty members and staff from the three State Universities in the Philippines with Level IV status and designated as a center of excellence in teacher education. The questionnaires were distributed to the faculty and staff of different colleges in the university. The respondents were answered the questionnaire based on their willingness. After 1 week the questionnaires were retrieved. The gathered data were analyzed and interpreted using appropriate statistical tools.

Research Instrument

The questionnaire was used to record the responses of each respondent contained mainly close-ended question using a seven-point Likert-type scale.

Scale	Range	Verbal Interpretation	
7	6.15 – 7.00	Always True	Exceptional
6	5.29 – 6.14	Very Often True	Excellent
5	4.43 – 5.28	Often True	Very Good
4	3.57 – 4.42	Occasionally True	Good
3	2.71 – 3.56	Rarely True	Fair
2	1.85 – 2.70	Usually Not True	Poor
1	1.00 – 1.84	Never True	Very Poor

The questionnaire was divided into three sections. The first and second sections include questions about the respondents' personal experience on KM Practices of their university on the Key Factors of KM and KM Processes. The third section includes questions regarding the respondents' personal experience on KM Performance Outcomes of their respected university.

RESULTS AND DISCUSSION

Table 1. KM Practices of State Universities on the Key Factors of KM

Key Factors of KM	Mean	Verbal Interpretation
Organizational Culture	5.60	Very Often True
Leadership	5.64	Very Often True
Information Technology	5.40	Very Often True
Employee Motivation	4.35	Very Often True
Average	5.50	Very Often True

Table 1 shows the mean scores for all the four key factors of KM in the State Universities. The average mean score is 5.50. The highest is leadership (5.64), followed by organizational culture (5.60), information technology (5.40), and employee motivation (5.35). This means that the four key factors are very often true experienced by the faculty and staff in State Universities.

Table 2. KM Practices of State Universities on KM Processes

KM Processes	Mean	Verbal Interpretation
Knowledge Generation	5.85	Very Often True
Knowledge Storage	5.46	Very Often True
Knowledge Sharing	5.54	Very Often True
Knowledge Application	4.51	Very Often True
Average	5.59	Very Often True

As presented in Table 2, the average mean score for all the four KM processes in state universities is 5.59. The highest is knowledge generation (5.85), followed by knowledge sharing (5.54), knowledge application (5.51), and knowledge storage (5.46). Similar to the four key factors of KM, KM processes also very often true experienced by the faculty and staff in State Universities.

Table 3. KM Performance Outcomes of State Universities

KM Performance Outcomes	Mean	Verbal Interpretation
Teaching	5.29	Very Good
Research	5.25	Very Good
Citations	5.12	Very Good
International Outlook	4.68	Very Good
Industry Income	5.23	Very Good
Average	5.12	Very Good

Table 3 shows the average mean scores for the KM performance outcomes of State Universities surveyed. The mean scores for teaching (5.29), research (5.25),

industry income (5.23), citations (5.12), and international outlook (4.68) indicates that the State Universities have a very good performance outcome.

Relationship between the Key Factors of Knowledge Management and Knowledge Management Processes

Table 4 shows the relationship between the level of KM Practices on the Key Factors of KM and KM Processes. The findings of this study indicate a significant relationship between the Key Factors of KM and KM Processes. The level of KM Practices on KM Processes in terms of Knowledge Generation, Knowledge Storage, Knowledge Sharing, and Knowledge Application is significantly associated to the Key Factors of KM Organizational Culture, Leadership, Information Technology, and Employee Motivation. On the average, 77.00% (r = 0.880) of the level of practices on KM Processes is related to the Key Factors of KM.

These findings imply that Employee Motivation (73.00%, r = 0.857) has the greatest contribution to the Generation, Storage, Sharing and Application of Knowledge. Employee motivation is very important for the faculty and staff because if they are motivated they perform better. Employee Motivation refers to organizational rewards such as monetary incentives (bonuses) and non-monetary incentives (praise, promotion, and job security). Further, the three universities have good budgeting scheme and a developed set of indicators for KM.

The results are consistent with the studies stating that organizational rewards were imperative to build a significant knowledge sharing relationship [25] and used to encourage academic staff to share [26]. Moreover, university reward system can enhance the effort and involvement of faculty members in knowledge sharing [27] and can also influence the commitment of other members to share knowledge [28].

Table 4. Relationship between the Levels of Knowledge Management Practices of Higher Education Institutions on the Key Factors of Knowledge Management and Level of Knowledge Management Processes

Key Factors of Knowledge Management	Knowledge Management Processes	Pearson-r	P	H ₀	Significance
Organizational Culture	Knowledge Generation	.684	.000	R	S
	Knowledge Storage	.675	.000	R	S
	Knowledge Sharing	.712	.000	R	S
	Knowledge Application	.729	.000	R	S
	Average	.741	.000	R	S
Leadership	Knowledge Generation	.749	.000	R	S
	Knowledge Storage	.715	.000	R	S
	Knowledge Sharing	.747	.000	R	S
	Knowledge Application	.735	.000	R	S
	Average	.779	.000	R	S
Information Technology	Knowledge Generation	.692	.000	R	S
	Knowledge Storage	.717	.000	R	S
	Knowledge Sharing	.727	.000	R	S
	Knowledge Application	.728	.000	R	S
	Average	.758	.000	R	S
Employee Motivation	Knowledge Generation	.770	.000	R	S
	Knowledge Storage	.831	.000	R	S
	Knowledge Sharing	.829	.000	R	S
	Knowledge Application	.809	.000	R	S
	Average	.857	.000	R	S
Average	Knowledge Generation	.812	.000	R	S
	Knowledge Storage	.826	.000	R	S
	Knowledge Sharing	.847	.000	R	S
	Knowledge Application	.842	.000	R	S
	Average	.880	.000	R	S

R – Reject, S - Significant

Leadership has a significant and positive relationship with knowledge generation and knowledge transfer [29]. In this study, 61.00% ($r = 0.779$) of the Knowledge Management Processes is associated with Leadership. The leaders' vision and action on the inclusion of KM in the Strategic Plan; and the Income Generating Potential of knowledge assets link the faculty members' practices in generating, storing, sharing and applying knowledge. Across higher education institutions, leadership plays an effective role in knowledge sharing behavior which subsequently enhances the knowledge exchange practices [30].

Moreover, the KM Processes is associated to fifty-seven percent (57.00%, $r = 0.758$) Information Technology and 55.00% ($r = 0.741$) Organizational Culture. Information technology brings faculty, staff, and students for easy access of information and links everyone to the relevant public information. This means that availability of IT facilitates knowledge culture and easy access to information facilitates better decision making in all aspects of KM. Similarly, Organizational Culture, in terms of its strategy in attaining its vision and mission, knowledge sharing in training and developmental activities and development of creative thinking skills initiates good practices in knowledge generation, storage, sharing, and application.

Since the use of information technology in public higher education institutions in Malaysia allows knowledge management processes such as knowledge capture, storage, and transfer to take place [31], organizational competitiveness can be achieved [32]. In addition, technology plays a key role in managing knowledge [33]. However, the studies of Andreeva and Kianto [34], Choi and Lee [35], and Davison, Ou and Martinsons [36] have found that information technology has no impact on knowledge management processes.

Organizational culture plays an important role and have the greatest positive impact on the processes of generating, storing, sharing, and applying knowledge [37],[38],[9],[39],[40],[33],[25]. Culture has been regarded as the most critical feature in supporting knowledge management processes [41],[42],[43]. When organizational culture is being practiced, the knowledge management is likely to be greater [35]. However, there are studies that say culture does not influence knowledge generation and knowledge transfer [29].

Relationship between Knowledge Management Processes and Knowledge Management Performance Outcomes

Table 5 shows the relationship between KM Processes and KM Performance Outcomes. The findings of this study indicate a significant relationship between the KM Processes and KM Performance Outcomes. The level of KM Performance Outcomes in terms of Teaching, Research, Citations, International Outlook, and Industry Income is significantly associated with the Knowledge Generation, Storage, Sharing, and Application. On the average, 69.00% ($r = 0.831$) of KM Performance Outcomes is related to KM Processes.

These findings imply that Knowledge Application (73.00%, $r = 0.854$) has the greatest contribution to the Teaching, Research, Citations, International Outlook, and Industry Income. Knowledge Application refers to the application of different best practices in the teaching and learning process and research and utilization of different technology for the development of new knowledge. Further, the three universities have best practices in the educational process, research projects, and solving new challenges.

The result is consistent with the study of Darroch [44] concluded that knowledge acquisition (knowledge generation), knowledge dissemination (knowledge sharing), and responsiveness to knowledge (knowledge application) positively predicted innovation. An organization capable of all three knowledge processes is more innovative.

Knowledge sharing is one of the foundational weapons that enable the organization to increase innovation and enhance scientific researches [45],[35],[46],[47],[40]. In this study, 64.00% ($r = 0.799$) of the knowledge management performance outcomes is associated with knowledge sharing. University libraries and resource centers; symposiums, lectures, conferences, and teaching and training sessions; and participation in multidisciplinary and interdisciplinary research teams link the knowledge management performance outcomes of the university.

Moreover, the KM Performance Outcomes is associated to sixty-two percent (62.00%, $r = 0.789$) Knowledge Storage and 48.00% ($r = 0.694$) Knowledge Generation. This means, archiving on the content and implementation of the educational process, research projects and important lectures and researches; and patenting and copyrighting facilitates storing knowledge. Similarly, knowledge generation, in terms of support to faculty and staff to pursue graduate

studies, strong linkages/partnership with companies and other organizations, cooperation with other institutions of higher learning, and well-developed research activities initiates good knowledge management performance outcomes.

The findings also corresponded with Mohayidin et al. [8] stating that storing knowledge had a strong positive impact on adding value to university performance especially in teaching and learning.

Furthermore, Ohiorenoya and Eboreime [48] and Naser et al. [49] stated that the performance of the university in innovation, growth, and competitive advantage will be significantly improved through fostering knowledge management processes (creating knowledge, capturing knowledge, organizing knowledge, storing knowledge, disseminating

knowledge, and applying knowledge). Similarly, Ramachandran et al. [50] stated that higher education institutions needed to give equal attention on all the knowledge management processes (processes of creating, gathering, organizing, storing, diffusing, use, and exploitation of knowledge) to achieved the desired performance outcomes such as better decision-making; staff and student handling; improved employee skills; productivity; communication; innovation and creativity; learning/adaptation capability; enhanced intellectual capital, collaboration, and product or service quality. Also, knowledge management processes have a positive effect on organizational performance such as human capital and collaboration [51] and research innovation [52].

Table 5. Relationship between the Level of Knowledge Management Processes and Knowledge Management Performance Outcomes of Higher Education Institutions

Knowledge Management Processes	Knowledge Management Performance Outcomes	Pearson-r	P	H ₀	Significance
Knowledge Generation	Teaching	.681	.000	R	S
	Research	.666	.000	R	S
	Citations	.577	.000	R	S
	International Outlook	.572	.000	R	S
	Industry Income	.682	.000	R	S
	Average	.694	.000	R	S
Knowledge Storage	Teaching	.726	.000	R	S
	Research	.769	.000	R	S
	Citations	.704	.000	R	S
	International Outlook	.674	.000	R	S
	Industry Income	.731	.000	R	S
	Average	.789	.000	R	S
Knowledge Sharing	Teaching	.775	.000	R	S
	Research	.766	.000	R	S
	Citations	.696	.000	R	S
	International Outlook	.670	.000	R	S
	Industry Income	.748	.000	R	S
	Average	.799	.000	R	S
Knowledge Application	Teaching	.801	.000	R	S
	Research	.811	.000	R	S
	Citations	.754	.000	R	S
	International Outlook	.743	.000	R	S
	Industry Income	.792	.000	R	S
	Average	.854	.000	R	S
Average	Teaching	.790	.000	R	S
	Research	.798	.000	R	S
	Citations	.724	.000	R	S
	International Outlook	.705	.000	R	S
	Industry Income	.782	.000	R	S
	Average	.831	.000	R	S

R – Reject, S – Significant

CONCLUSION AND RECOMMENDATION

The study examined the relationship between the Key Factors of KM and KM Processes; and KM Processes and KM Performance Outcomes and has come to the conclusion that employee motivation greatly influences organizational practices on knowledge generation, storage, sharing, and application. Likewise, knowledge application greatly influences organizational performance in teaching, research, citations, international outlook, and industry income.

Therefore, in order to achieve better performance the university official may motivate the faculty and staff through rewards such as bonuses, praises, promotion, and job security. The administrators may apply own experience for solving new challenges and critically evaluate the knowledge generated by the faculty and staff for further use.

This study contributes in the improvement of university performance in achieving its vision, mission, goals, and objectives. The study also opens up the avenue for future research possibilities. Perhaps one of the major weaknesses of this study is the small sample size. A larger sample size across all State Universities is recommended to validate the findings presented in this study.

REFERENCES

- [1] Salazar-Clemen, R. M., & Almonte-Acosta, S. A. (2007). Developing research culture in Philippine higher education institutions: perspectives of University faculty rose. Paper presented at the UNESCO Forum on Higher Education, Research and Knowledge, Hangzhou, China.
- [2] UNESCO Institute for Statistics. (2014). Higher education in Asia: Expanding out, expanding up: The rise of graduate education and university research. Retrieved from <https://goo.gl/aLQCQJ>
- [3] Commission on Higher Education. (2009). National higher education research agenda-2: NHERA 2: 2009-2018. Manila, Philippines: CHED.
- [4] Wa-Mbaleka, S. (2015). Factors leading to limited faculty publications in Philippine higher education institutions. *International Forum*, 18 (2), 121-141.
- [5] Lozano, R., Lukman, R., Lozano, F. J., Huisingh, D., & Lambrechts, W. (2013). Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, 48, 10-19.
- [6] Hijazi, S., & Kelly, L. (2003, June). Knowledge creation in Higher Education Institutions: a conceptual model. In *Proceedings of the 2003 ASCUE Conference* (pp. 118-125).
- [7] Metaxiotis, K., & Psarras, J. (2003). Applying knowledge management in higher education: the creation of a learning organisation. *Journal of Information & Knowledge Management*, 2(04), 353-359.
- [8] Mohayidin, M. G., Azirawani, N., Kamaruddin, M. N., & Margono, M. I. (2007). The application of knowledge management in enhancing the performance of Malaysian Universities. *The Electronic Journal of Knowledge Management*, 5(3), 301-312.
- [9] Ramachandran, S. D., & Chong, S. C. (2009). Competing values framework and knowledge management processes in Malaysian Universities. In *Knowledge Management International Conference 2009 (KMICe2009)* (pp. 110-115).
- [10] Abdullah, R., bin Shahabudin, S., Alias, R. A., & Selamat, M. H. (2007). Developing knowledge management system for public higher learning in collaborative environment. *International Journal of Computer Science and Network Security*, 7(7), 331-41.
- [11] Yeh, Y. M. C. (2011). The implementation of knowledge management system in Taiwan's higher education. *Journal of College Teaching & Learning (TLC)*, 2(9), 35-42.
- [12] al-Ammal, H., & Al-Bourshaid, M. Knowledge Management Strategies for Quality Assurance at a Higher Education Institute.
- [13] Baban, C. F. (2007). A knowledge management approach in higher education. In *Proceedings of KSS'2007: The Eight International Symposium on Knowledge and Systems Sciences* (pp. 104-107).
- [14] Ismail, H., Abdullah, R., & Jusoh, Y. Y. (2016). Benchmarking process of knowledge management best practice model for higher learning institution. *Knowledge Management International Conference*, 209-216.
- [15] Mikulecky, P., & Mikulecka, J. (1999). Active tools for better knowledge dissemination. *Proceedings of the ASIS Annual Meeting*, 36, 420-27.
- [16] Sağsan, M. (2006). A new life cycle model for processing of knowledge management. *2nd International Congress of Business, Management and Economics* (pp. 15-18).
- [17] Bhusry, M., Ranjan, J., & Nagar, R. (2011). Implementing knowledge management in higher educational institutions in India: a conceptual framework. *International Journal of Computer Applications*, 29(1), 34-46.
- [18] Ojo, A. I. (2016). Knowledge management in Nigerian Universities: a conceptual model. *Interdisciplinary Journal of Information, Knowledge, and Management*, 11, 331-345.
- [19] Bloom, D. (2005). Raising the pressure: globalization and the need for higher education reform. *Creating*

- Knowledge: Strengthening Nations: The Changing Role of Higher Education*, University of Toronto Press, Toronto, 21-41.
- [20] Ridzuan, A. A., & Sam, H. K. (2009). Knowledge management practices in higher learning institutions in Sarawak. *Asian Journal of University Education*, 4(1), 69-89.
- [21] Danielsen, F., Jensen, P. M., Burgess, N. D., Holt, S., Poulsen, M. K., Rueda, R. M., & Pirhofer-Walzl, K. (2014). Testing focus groups as a tool for connecting indigenous and local knowledge on abundance of natural resources with science-based land management systems. *Conservation Letters*, 7(4), 380-389.
- [22] Dalkir, K. (2009). Knowledge management. *Encyclopedia of Library and Information Sciences* (3rd ed., pp.3129-3138). New York: Taylor and Francis
- [23] Commission on Higher Education. (2018). 2016 SUC levelling results, SUC levelling benefits, and SUC levelling appeal procedures. Manila, Philippines: CHED.
- [24] Commission on Higher Education. (2016). Designated centers of excellence (COEs) and centers of development (CODs) for Teacher Education Program. Manila, Philippines: CHED.
- [25] Tan, C. N.-L., & Noor, S. M. (2013). Knowledge management enablers, knowledge sharing and research collaboration: a study of knowledge management at research universities in Malaysia. *Asian Journal of Technology Innovation*, 21(2), 251-276.
- [26] Lin, H. F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of information science*, 33(2), 135-149.
- [27] Yu, S. H., Kim, Y. G., & Kim, M. Y. (2004, January). Linking organizational knowledge management drivers to knowledge management performance: an exploratory study. In *System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on* (pp. 10-pp). IEEE.
- [28] Beer, M., & Nohria, N. (2000). Cracking the code of change. *HBR's 10 must reads on change*, 78(3), 133-141.
- [29] Sunalai, S. (2015). *Knowledge Management Systems in Higher Education Institutions in Thailand: A Holistic Model of Enablers, Processes, and Outcomes* (Doctoral dissertation).
- [30] Tahir, L. M., Musah, M. B., Abdullah, A. H., Musta'amal, A. H., & Abdullah, M. H. A. (2016). Technical college teachers sharing their knowledge: does leadership, institutional factors or barriers predict their practices?. *Educational Studies*, 42(5), 465-492.
- [31] Ramachandran, S. D., Chong, S. C., & Wong, K. Y. (2013). Knowledge management practices and enablers in public universities: a gap analysis. *Campus-Wide Information Systems*, 30(2), 76-94.
- [32] Sulisworo, D. (2012). Enabling ICT and knowledge management to enhance competitiveness of higher education institutions. *International journal of Education*, 4(1), 112.
- [33] Omar Sharifuddin Syed-Ikhsan, S., & Rowland, F. (2004). Knowledge management in a public organization: a study on the relationship between organizational elements and the performance of knowledge transfer. *Journal of knowledge management*, 8(2), 95-111.
- [34] Andreeva, T., & Kianto, A. (2012). Does knowledge management really matter? Linking knowledge management practices, competitiveness and economic performance. *Journal of knowledge management*, 16(4), 617-636.
- [35] Choi, B., & Lee, H. (2000). Knowledge management and organizational performance. *Inform-Korms, 2000*.
- [36] Davison, R. M., Ou, C. X., & Martinsons, M. G. (2013). Information technology to support informal knowledge sharing. *Information Systems Journal*, 23(1), 89-109.
- [37] Lee, S., Gon Kim, B., & Kim, H. (2012). An integrated view of knowledge management for performance. *Journal of Knowledge management*, 16(2), 183-203.
- [38] Omerzel, D. G., Biloslavo, R., Trnavčević, A., & Trnavčević, A. (2011). Knowledge management and organisational culture in higher education institutions. *Journal for East European Management Studies*, 111-139.
- [39] Rivera, G., & Rivera, I. (2016). Design, measurement and analysis of a Knowledge Management model in the context of a Mexican University. *Innovar*, 26(59), 21-34.
- [40] Sohail, M. S., & Daud, S. (2009). Knowledge sharing in higher education institutions perspectives from Malaysia. *VINE: The Journal of Information and Knowledge Management Systems*, 39(2), 125-142.
- [41] Heisig, P. (2009). Harmonisation of knowledge management—comparing 160 KM frameworks around the globe. *Journal of knowledge management*, 13(4), 4-31.
- [42] Richter, T., & Pawlowski, J. M. (2008). Adaptation of E-Learning Environments: Determining National Differences through Context Metadata. *TRANS-Internet Journal for Cultural Studies*, 17.
- [43] Bick, M., & Pawlowski, J. M. (2009, March). Applying Context Metadata in Ambient Knowledge and Learning Environments-A Process-oriented Perspective. In *Wissensmanagement* (pp. 52-67).

- [44] Darroch, J. (2005). Knowledge management, innovation and firm performance. *Journal of knowledge management*, 9(3), 101-115.
- [45] Al-Husseini, S. & Elbeltagi, I. (2012). The impact of leadership style and knowledge sharing on innovation in Iraqi higher education institutions. In *Proceedings of the 4th European Conference on Intellectual Capital* (pp. 26-35).
- [46] Palacios Marqués, D., & José Garrigós Simón, F. (2006). The effect of knowledge management practices on firm performance. *Journal of knowledge management*, 10(3), 143-156.
- [47] Mohammed, M. A. & Anad, M. M. (2014). Knowledge Sharing to Enhance Scientific Research Among Universities.
- [48] Ohioyenoye, J. O., & Eboreime, O. F. (2014). Knowledge management practices and performance in Nigerian Universities. *European Scientific Journal*, 10(16), 400-416.
- [49] Naser, S. S. A., Al Shobaki, M. J., & Amuna, Y. M. A. (2016). Measuring knowledge management maturity at HEI to enhance performance-an empirical study at Al-Azhar University in Palestine. *International Journal of Commerce and Management Research*, 2 (5), 55-62.
- [50] Ramachandran, S. D., Chong, S. C., & Lin, B. (2008). Perceived importance and effectiveness of KM performance outcomes: perspective of institutions of higher learning. *International Journal of Innovation and Learning*, 5(1), 18-37.
- [51] Rasula, J., Vuksic, V. B., & Stemberger, M. I. (2012). The impact of knowledge management on organisational performance. *Economic and Business Review for Central and South-Eastern Europe*, 14(2), 147.
- [52] Paez-Logreira, H., Zamora-Musa, R., & Velez-Zapata, J. (2016). Relation Analysis of Knowledge Management, Research, and Innovation in University Research Groups. *Journal of technology management & innovation*, 11(4), 5-11.

COPYRIGHTS

Copyright of this article is retained by the author/s, with first publication rights granted to APJMR. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4>).