

The 4E Knowledge Management Model for Philippine Higher Education Institutions

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Abstract – Universities are the main enablers of knowledge capital to respond to the challenges of knowledge economy. Leading companies and institutions have been innovatively adopting Knowledge Management but not among universities. This qualitative, multiple-case research design study aimed to develop a knowledge management model for the adoption of Philippine higher educational institutions. Five universities were purposively selected as participants. The findings revealed that the knowledge management's operationalization were inadequate and not clearly delineated because of lack of framework to guide. Interestingly, its outcomes support the achievement of higher education mission. The basic management functions and diffusion of innovation were utilized in the adoption of knowledge management. The four major emerging themes drawn were empowering, n, enacting, and engaging which were used as rudiments in the 4E of Knowledge Management model development. In conclusion, although Knowledge Management in Philippine higher education institutions is still in the infancy stage, with the utilizations of its processes, management functions and diffusion of innovation, a model was developed. This study intends to fill the dearth in literature and the absence of a model in higher educational institutions. This model can provide innovations among universities in the performance of their functions in instruction, research, extension, and productivity.

Keywords – education, diffusion of innovation, higher educational institutions, knowledge management, management functions, multi-case study, Philippines

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INTRODUCTION

Higher Educational Institutions (HEIs), having knowledge creation as its pinnacle of business, face the greatest challenge to strategically position themselves in order to be responsive to the new demands of the knowledge economy. The universities are the main formal means of creating, disseminating and transferring knowledge, which is the key factor for the growth of the global economy [1]. Hence, educational leaders must champion innovations to achieve effectiveness and efficiency in realizing their organizational objectives and remain competitive in the field.

One of the innovations gaining popularity in organizations is Knowledge Management (KM) which helps improve organizational processes and strategies, enhances institutional reputation, and promotes collaborations and innovations [2]. It has already reached the level of a scientific discipline [3] and attracts increasing interest in research and practice (Dwivedi et al. 2011). The number of KM publications is growing exponentially [4], comprising a variety of topics including knowledge definitions and theories to managerial implementation approaches [5], [6].

Very recently, the International Standards Organization (ISO) (2018), released the Knowledge Management Systems - Standards (ISO 30401:2018) to support organizations to develop a management system that effectively promotes and enables value-creation through knowledge. It enjoins each organization to craft its own knowledge management solution, reflecting its specific needs and situation and produce valuable results derived from applied knowledge.

Higher educational institutions, as knowledge-based institutions, are expected to manage knowledge for sustainable competitive advantage, growth, and innovation [7]. As leaders in the field of knowledge production, research, and societal development, they are expected to be drivers of innovation, thereby contributing to the development of a learning society [8].

Despite the increasing popularity and seminal adoption of KM in some HEIs, there are lacunae that need to be addressed. As posited by Kulkarni and Mulay [9] KM as an area, for instance, needs to be further explored and exploited for its full benefits to be reaped. Only a few existing research studies on KM have clarified what it means in a diverse context [10]. There is no organized KM system in place or even an understanding of such a system [11]. There is a growing need for more empirical assessment of KM practices and enablers in HEIs, especially in the context of a complex and unstable environment [12]. Notwithstanding that KM is a tool for innovations that offers sustainable advantage [13].

In view of the abovementioned advantages of KM in higher educational institutions and the identified gaps which impede its adoption in higher education institutions, particularly in the Philippines, there is an impetus to develop a model. This is essential so that the operationalization of the processes of KM can be contextualized within the unique setting of higher educational institutions. This is also necessary so that the outcomes of KM unique to higher educational institutions can be fully attained. Moreover, this is imperative so that educational administrators can have the fundamental skills to govern KM implementation by integrating basic management functions. Lastly, this is pivotal so that the groundbreaking efforts of higher educational institutions to initiate and sustain KM can be guided with the strategy on the diffusion of innovation.

OBJECTIVE OF THE STUDY

This study aimed to develop a KM model for the adoption of higher educational institutions in the Philippines. It sought an answer to the main research question: What KM paradigm can be generated for adoption in the higher educational institutions (HEIs) in the Philippines? Specifically, this sought answers to How do educational administrators operationalize and contextualize KM in their institution in terms of knowledge resources, process, and influences?

METHODOLOGY

Research Design.

This inquiry utilized the qualitative, multiple-case study research design. A total of five participants agreed to take part in this case study from the seven target participants who were selected with the following criteria: 1) university executives who are in charge of KM initiatives, strategies and change

management; 2) appointed as knowledge managers so as to delineate the management functions utilized; 3) manage a department involved in KM operations in order to describe KM implementation and diffusion of innovation; and 4) employed as full-time in a university officially registered with the Commission on Higher Education (CHED). Researchers typically choose no more than four or five cases (Creswell, 2013). The research instruments comprised of open-ended questions which were validated by the following: 1) Officer from CHED- Office of Planning, Research and KM (OPRKM); 2) Professor from Educational Research, and 3) Professor from Language Education.

Data Gathering Procedures.

A letter of permission was sent to the University President to conduct the study, interview the participants, review documents, and observe physical artifacts related to KM operation. A letter of consent was then secured from the KM Director participant. In the collection of data, the main idea was to “triangulate” or establish converging lines of evidence to make findings as robust as possible [14]. Hence, multiple sources of evidence were pursued in this study.

Data Analysis.

The researcher espoused Creswell’s [15] process of data analysis and representation which included organizing the data, conducting a preliminary read-through of the database, coding and organizing themes, representing the data, and forming an interpretation of them. The within-case analysis was utilized in this study wherein an in-depth exploration of a single case, regarded as a stand-alone entity, was conducted. Consequently, the cross-case analysis was conducted after the within-case analysis. Multiple case studies were adopted to illustrate the different perspectives on the issue and to yield strong confirmation of evidence. The researcher practiced due diligence in applying ethical consideration anchored from [16]) Ethical Issues to Anticipate at the beginning of this study, during data collection, and analysis.

RESULTS AND DISCUSSION

The educational administrator’s operationalization and contextualization of KM in terms of the knowledge resources of the university, the processes involved in managing knowledge, and the prevailing influences of KM.

Knowledge resources. The following results were based on the themes that emerged. The organizational knowledge was defined as a) knowledge capital to produce outputs and achieve tasks, and b) unfamiliarity with organizational knowledge. The level in which organizational knowledge exists a) at all organizational level, and b) extra-organizational knowledge not so utilized. The tangible pieces of evidence of knowledge resources were the following: a) high-impact and cutting-edge researches; b) instructional material for commercialization; and c) university standards and procedure.

According to Tsoukas and Vladimirou [17], Organizational knowledge is the capability that members of an organization have developed to draw distinctions in the process of carrying out their work, whose application depends on historical evolution and collective understandings and experiences. Frost's description (2017) coincides with the case of KMU2 and KMU5, stating that knowledge resources existing outside the organization can be used to enhance the performance of the organization.

Processes. The operationalization of KM involved six processes, namely, acquire, create, store, share, use, and assess were all practiced but in varying activities and extent. The themes that emerged from the processes involved in KM practice were the following: a) generation, collection, storing, sharing, monitoring of research outputs, data, reports, and records; and b) not yet clearly defined for a few university participants. Acquiring knowledge was through a) internally (self-directed learning, understanding data/information, accessing the latest academic resources); b) externally (resource speakers, seminars, training, conferences). Creating knowledge was through a) researches responsive to internal and external needs; b) instructional materials; and c) reports and information relevant to organizational development. Storing knowledge was through a) electronically and non-electronic database; b) database of research and instructional materials; and c) database of university intellectual property rights, information, and policies. Storing knowledge was through a) electronically and non-electronic database; b) database of research and instructional materials; and c) database of university intellectual property rights, information, and policies. Sharing knowledge was through a) internal knowledge and practices to improve instruction; b) research presentation and publication to the academic community; and c) outside of the organization (as resource speakers, research outputs for community extension, via electronic means, with agencies and companies). Utilizing knowledge was through a) research outputs within (for instruction, policy

development, standards, and curriculum); b) research outputs outside of the organization (for extension program, technology development, commercialization); and c) instructional resources for commercialization. Assessing knowledge was through a) feedback from members within the organization and from proper authorities/specialists for quality assurance, and b) evaluation is predominantly practiced instead of assessment.

The KM processes apparent in the cases were supported by Omerzel, et al, [18] and Omona, et al, [19], who purported that KM focuses on how organizations identify key knowledge, create new knowledge, transfer of knowledge and how they represent, adapt and develop good practices used in this knowledge process. The observed unfamiliarity of organizational knowledge was also substantiated with Bivainis and Morkvėnas [20]. They argued that, in the assessment of the organization's knowledge potential, not only the definition of the organization's knowledge potential concept but also the complex approach and evaluation methods, are absent. Generally, the findings are in accordance Sunalai and Beyerlein [21] who stated that knowledge acquisition as activities of the accessibility and assimilation of the knowledge gained. It is the creation of knowledge as the development of new knowledge or the replacement of existing knowledge. The storing of knowledge in an organization's members is to have its mechanisms so that it can be easily retrieved. The sharing process involved the exchange of ideas between people. The use of knowledge is to apply it to an individuals' work embedded within organizational operations. Assessing knowledge is the analysis that assures the usefulness and value of knowledge for an organization [21].

Influences. The contextualization of influences in knowledge resources was in terms of organizational management, human orientation, and KM mechanism.

Organizational Management. The organizational management that facilitated KM was in terms of technology, communication, policy and procedure, motivation and reward system, structure, and human resource practice. Technology facilitated KM through a) IT resources, and b) infrastructure. Communication facilitated KM through a) communication among community digitally, and b) communication among the community. Policy and procedure facilitated KM through a) institutional policy and procedures to guide practice. Motivation and reward system facilitated KM through: a) monetary incentives; and b) non-monetary incentives. Structure facilitated KM through a) top management support: mandate, actions, resources; and b) KM inclusion in organizational structure. Human

resource practice facilitates KM through a) competency development through an internal and external source.

Several authors concurred with the above findings pertaining to the influences of KM. The infrastructure of technological devices and systems (such as hardware, software, network) can be used to enhance the development and distribution of knowledge across an organization [22]. Creating a knowledge-sharing culture among organizational members is one of the most effective mechanisms that support the KM processes better [23]. Tan and Noor [24] highlight that knowledge sharing involves include face-to-face interactive communication. Chumjit [25] adds to this by stating that the knowledge-sharing platform called a community of practice that can be done through story-telling techniques. The use of policy and procedure among the cases are in accordance with the works of several authors who describe organizational management mechanisms for KM implementation which include policy and strategy [23], internal process [26], workload and time constraint [25]. The implementation of a system that encourages further KM within an organization, as aforementioned, is in consonance with the work of Tan and Noor [24]. They explained that social and psychological aspects that encourage individuals to feel rewarded to share knowledge in their workplace community from monetary, such as bonuses and incentives, to non-monetary incentives, such as recognition and promotion. As observed in the earlier cases, it is in line with Cranfield [27], stating that structure involves management structure and style, a chain of command in managing knowledge. The case of KMU1 and KMU2 was also reported by Mohayidin et. al., [27] describing the structure as an initiative from top management to create KM culture. Personal development activities as provided by an institution aims to increase an individual's understandings and skills for KM implementation [23]. This can be observed in the cases mentioned above.

The Organizational management that impeded were a) lack of KM framework/model, expert, formal training, resource; b) slow government procurement process; and c) individual capability and motivation. Other OM means needed for KM's success were a) enough manpower and available material resources; and b) a doable KM model, supporting culture and chain of command for KM.

Human Orientation. The overall beliefs and behaviors among teachers that enable them to share their ideas and knowledge were a) positive; and b) negative for a few. On the other hand, the overall beliefs and

behaviors among employees that enable them to share their ideas and knowledge were) positive. The top management's supportive actions towards KM were a) instituting KM structure a system; b) visible support in KM initiatives; c) monetary and non-monetary support, and d) investing in KM's manpower capacity building. These findings of human orientation were corroborated with previous studies. The knowledge-sharing aspects of a culture is comprised of community-orientation, trust or openness, collaboration; individuals' willingness to share knowledge, their' values, norms, and behaviors to conduct KM [24]. This depicts that the organization cultivates a culture wherein their employee's individual attitudes and skills are valued. This is in agreement with numerous authors stating that an individual's attitude and skill as the organization members' perceptions [29], understanding [25] or knowledge, and experiences or skills [27] regarding KM practices, in particular the importance and use of KM [30] Knowledge self-efficacy and volunteerism - an individual's voluntary willingness and ability to share knowledge in a team ([24]. According to Ramachandran et. al., [31] some of the attitudes and supportive actions that top management can give included the leaders' abilities to align KM with organizational strategy, promoting the value of KM, facilitating the development of a learning organization, and assessing the impact of KM's understanding of the importance of KM and their engagement in knowledge sharing practices [24].

KM Mechanism. The KM system evaluated its outcomes through a) institutionalized performance evaluation, and b) external accreditations/certification. The KM system improved its outcomes through a) evaluating performance against targets; b) integration of continuous improvement, innovation, strategic planning; and c) responding to needs assessment. The individuals' level of confidence with KM was not palpable yet. The way the university participants evaluated their outcomes were in line with the study of Ramachandran et al. [31], stating that evaluating outcomes are to control, evaluate, and improve knowledge practices to ensure that KM stays on track. The university participants' focus on improving their performance is supported with previous study.

Contribution to Theorizing in Educational Administration

The researcher theorized knowledge sharing and transfer as the main business of higher educational institutions; hence, KM is inherent in its operations and builds through it. To delve into this contemporary

phenomenon, which is KM, in the real-life context of higher educational institutions, theoretical groundings were used to ensure an in-depth approach. A thorough search on the relevant literature yielded KM on higher education institutions abroad but bereft of the mechanism on how to adopt it in the context of the Philippines and the functions of the administrator in its implementation once adopted. In view thereof, the researcher employed Sunalai and Beyerlein's [32] meta-analysis from an integrative literature review of KM in Higher Education to understand the operationalization/contextualization of KM and its outcomes. To discover the basic management functions performed by educational administrators or knowledge manager, Carpenter, Bauer, and Erdogan's [33] frameworks were utilized. To determine how KM was initiated and sustained, Roger's [34] diffusion of innovation theory and Graham, Woodfield, and Harrison's [35] framework of adoption and implementation was used to determine how KM was initiated and sustained.

The KM model for adoption in Philippines HEIs

The KM Model for adoption in higher educational institutions has four rudiments, namely, Empowering, Enabling, Enacting, and Engaging.

The 4E KM model for adoption in higher educational institutions (Part A) is symbolized with the upper part of the human body as seen in Figure 2. It has four divisions which are the upper part of the head, the lower part of the head, the neck, and the shoulder; each corresponds to the four rudiments. Each part symbolizes the four emergent themes gleaned from the sharing of the university participants and the theoretical underpinnings of this study.

The symbolic figurehead will be tackled from its apex down to its base. Each rudiment will have to be considered and operationalized within the unique context of the institution.

The upper part of the head symbolizes the Empowering rudiment. This part of the body holds the brain where all the thinking, analyzing, controlling of the whole movement and functioning of the body happened. This is corresponding to the assessment and evaluation mechanisms established in the organization to meet if ambitiously unable to exceed the goals/targets. This empowers the organization to set its course to stay relevant, competitive, and exceptional in its performance. The empowering rudiment embodies the targets to be achieved such as the achievement of higher education mission, improvement of organizational management and effectiveness of KM.

The 4E Knowledge Management Model for Philippine Higher Education Institutions (Part A)

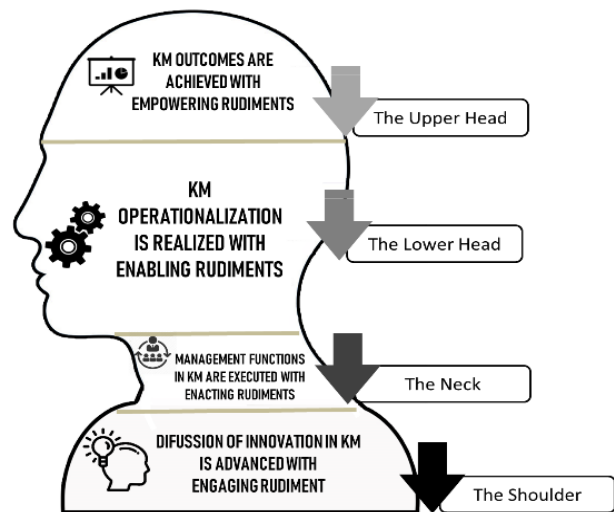


Figure 21. The 4E Knowledge Management Model for Philippine HEIs (Part A)

The lower part of the head symbolizes the Enabling rudiment. This part of the body encompasses most organs for sensing like the eyes, ears, nose, and tongue which an individual uses to perceive external stimuli and accordingly act on them. This is parallel to the operations of the organization where, after environmental scanning, knowledge resources are mobilized, processes are capacitated with support of top management, employees' knowledge-sharing behavior, and evaluative mechanisms. This enables the organization to have the means and resources, not only to address prevailing problems but also to innovate the status quo. Enabling rudiment comprises organizational knowledge, KM processes, and influences.

The neck symbolizes the Enacting rudiment. This part of the body supports the head, which contains the brain, sensory organs, including vital coordinating nerves and blood vessels. This is analogous to the educational administrator assigned to a unit who carries the sole responsibility of collaborating between the top management and other departments toward a specific goal. This enacts the organization to execute innovations effectively and efficiently with an administrator officially appointed. The enacting rudiment includes planning, organizing, leading and controlling of the designated administrator or knowledge manager.

The shoulder symbolizes the Engaging rudiment. This part of the body serves as a wide platform to support the neck and the head and as the main attachment to the whole body. This is comparable with

the wide platform necessary for the diffusion of innovation. This engages the organization to institute efforts to diffuse up innovation to make it sustainable. The engaging rudiment encompasses the strategy, structure, support, and implementation.

The 4E KM model, Part B, as seen in Figure 3, is advanced. With the intention that this model can be easily adopted in Philippine higher educational institutions. The model starts with the empowering rudiment as the initial process that leads to the enabling rudiment to operationalize intended results with the support of enacting rudiment and the application of engaging rudiments.

The 4E Knowledge Management Model for Philippine Higher Education Institutions (Part B)

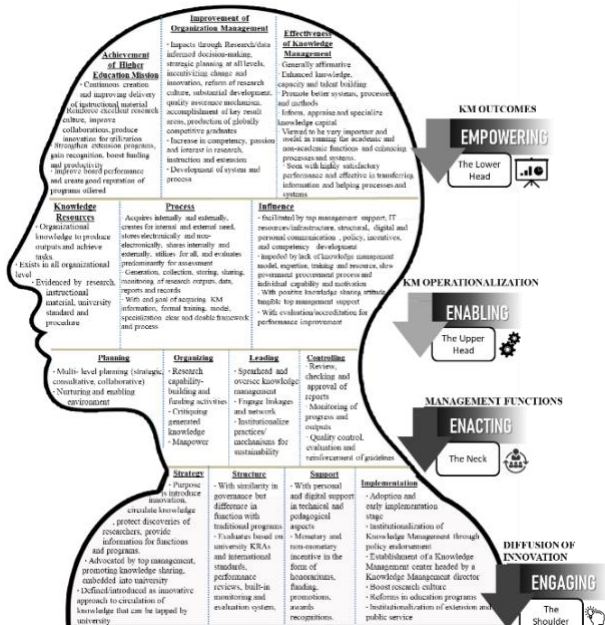


Figure 3. The 4E Knowledge Management Model for Philippine HEIs (Part B)

First, the *empowering rudiment* was captured from the emerging themes of the university participants' responses according to the outcomes of their KM strategic initiatives. The empowering rudiment includes the concepts of achievement of higher education mission, improvement of organizational management, and assessment of KM effectiveness. These are considered empowering rudiment because goals, which serve as an input to the processes, along with management support, are foundational elements in initiating KM in higher educational institutions. Moreover, it positions the higher educational

institutions to realize their abilities and potentials geared towards the attainment of their vision and missions. Likewise, it drives organizational management to be more directional and purposeful on the development and utilization of the institutions' knowledge capital. The achievement of higher education mission, which basically focuses on the trifocal functions of universities namely, instruction, research, and extension, with productivity as an addition, should be given premium. The organizational management should evolve in their decision-making, strategic planning, change management initiation, quality control establishment and organizational goals' achievement. The effectiveness of KM should contribute to faculty and employees' positive reception of KM that will prompt advancement and mobilization of knowledge capital.

Secondly, the *enabling rudiment* was unraveled from the emerging themes of the university participants' responses corresponding to their KM operationalization and contextualization. Enabling rudiment includes the concepts of knowledge resources, processes, and influences. The organizational knowledge, categorized as tacit and explicit, which existed in various levels of the organization should be clearly understood, identified, optimized, and translated into tangible evidence useful for the university. The processes of acquiring, creating, storing, sharing, using, and assessing should be fully introduced and embedded in the daily activities of top management, faculty, and non-teaching personnel. The influences which drive KM should also be mobilized while those that hinder be minimized or avoided. The following influences are pivotal and crucial towards the successful adoption of KM organizational management's which involves top managements' actions and provision of KM infrastructure; the human resource which involves the culture of knowledge sharing among teaching and non-teaching personnel; and the KM mechanism which involves evaluating the progress of KM, doing continuous improvement, and instilling confidence in KM among individuals.

Thirdly, the *enacting rudiment* was gleaned from the emerging themes of the university participants' responses in relation to the management functions carried out in the implementation of KM. The enacting rudiment integrates the concepts of planning, organizing, leading and controlling. These are regarded as enacting rudiment because it executes higher educational institutions' goals and objectives under the aegis of a leader who performs the management functions. The planning function should

be performed strategically to achieve goals successfully and efficiently. The organizing function should provide clear identification of the people responsible and a delineation job assignment to achieve the objectives. The leading function should be carried out with knowledge, competence, and direction. The controlling function should be executed with an objective evaluation of the performance against the established plan and proper regulation of resources.

Lastly, the *engaging rudiment* was culled from the emerging themes of the university participants' responses relative to how KM, as an innovation, was diffused. The engaging rudiment encompasses the concepts of strategy, structure, support, and implementation. These are reckoned as engaging rudiment because it drives higher educational institutions to set schemes in order to diffuse innovation as part of its standard operating procedures and work instructions. The strategy should clearly establish the purpose of why KM is implemented, craft its official KM definition and strive to develop new advocates. The structure should set up an approving body and utilize standard assessment for its evaluation. The support should both cover the technical and instructional and the monetary and non-monetary incentives. The implementation phase should be assessed continually, and its corresponding milestones identified to be able to set new directions.

CONCLUSION

The knowledge management operationalization, understanding, and identification of organizational knowledge were inadequate. The processes of knowledge management were practiced, however, not fully delineated and implemented. The influences in knowledge resources were in terms of organizational management, human orientation, and KM resources. The educational administrators applied the basic management functions and espoused the diffusion of innovation in the adoption of knowledge management. Knowledge Management in Philippine higher education institutions is still in the infancy stage. Four major themes emerged that were translated into rudiments of the model namely: empowering, enabling, enacting, and engaging. hence, the 4E Knowledge Management model for Philippine higher education institutions is developed

In this study, Sunalai and Beyerlein's (2015) meta-analysis of KM in higher educational institutions was validated with the operationalization/ contextualization of KM and its outcomes. Carpenter, Bauer, and Erdogan's (2015) frameworks substantiated the management functions performed by educational administrators or knowledge manager. Roger's (2003) diffusion of innovation theory and Graham, Woodfield, and Harrison's (2013) framework of adoption and implementation corroborated how KM was initiated and sustained.

The adoption of KM can be an innovative means for higher educational institutions to intensify the achievement of their mission to a niche or competitive advantage among others.

The study is limited to the scarcity of universities adopting KM during the data gathering for this study.

Future Directions. Culled from the conclusions of this study, the following recommendations are hereby offered: *For Practice.* Integrate the processes of Knowledge Management in the main functions of HEIs, namely, instruction, research, extension, and productivity. Adopt a model that can drive the implementation and outcomes of Knowledge Management. *For Policy.* Legislate the integration of Knowledge Management in the functions of schools, colleges, and universities just like research. Decree the inclusion of Knowledge Management practices as part of the key performance indicators to reinforce ISO certification and accreditation requirements. *For Research.* Conduct future research regarding the identification of extant organizational knowledge (tacit and explicit) and an exploration of the extant Community of Practice across the universities.

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