

Continuous Development of Knowledge Management for Higher Education Institutions

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Abstract. Higher educational institutions play a very important role in gaining, improving, using, supplying, and storing knowledge and making it available for their students. For the sake of the institutions, such information needs to be managed properly and constantly. The aim of this paper is to describe how to establish effective knowledge management so that it can bring maximum benefit for all academicians. For this purpose, higher educational institutions need to know the definition of knowledge management, its structure and role model, the way of obtaining innovation from it, the use of it. Understanding all mentioned makes it easier for them to manage knowledge and come up with constant innovations through an academic research which will reveal result information, innovative ideas, and data of innovation developed. The success of knowledge management program depends on three components, human resources, the management processes, and existing technology adopted in the institutions.

Keywords: knowledge management, research knowledge, innovation knowledge, higher educational institutions

INTRODUCTION

In the twenty-first century, knowledge management has an important role in modern business, organization, and academic worlds (Al-Shammari, 2008; Guetat & Dakhli, 2010; Husain, 2012; Omotayo, 2015; Zoubi, 2009). Boni and Walker (2016) mentioned that knowledge makes possible the development and changes of social lives in the world. It helps empower people wherever they are so that they can stimulate gradual development of social lives (Singer & Pezone, 2003). Such development is constantly needed because humans must face possible challenges to fulfill their needs improve their welfare (Fry, Ketteridge, & Marshall, 2008; Petrides & Nodine, 2003).

Recently, the world has become more sophisticated, either in the business world or in the academic ones. Particularly, the academic world has been more competitive when going through stages of development of the globalization era (Zoubi, 2009). To take part in this competition, Earnest, Joyce, de Mori, and Silvagni (2010) mentioned that higher educational institutions need educational processes of the best quality in responding to the changing demands of life. In addition to their being places of learning-teaching activities, higher educational institutions become the center of the development science, technology, art, and research. Therefore, the quality of higher educational institutions may reflect the quality of productivity a nation needs to improve the welfare state of its people. In general, modern states are founded by the quality of their higher educational institutions. Innovation-based knowledge in learning processes is a new philosophy a higher educational institution needs to adopt and develop. Innovation needed to deal with present and future challenges can be encouraged by establishing knowledge management.

King (2009) defined that a knowledge management is as a system offering processes of learning and innovation and sharing knowledge to accomplish strategic purposes of both business and educational organization. Then actually, mentioned by Gupta, Sharma, and Hsu (2008) that the main purpose of knowledge management is to transform individual knowledge into one shared with other members of an organization through such activities as gaining, storing, publishing, exploiting, and innovating. Establishing knowledge management can ensure that an organization shows its best performance and has fighting spirit of competition with other organizations, most of which apply

knowledge management as their resources (King, 2009). Theoretically, Michael, James, and Satyendra (2009) stated that the process of knowledge management involves identifying, collecting, organizing, sharing, applying, evaluating, using, and innovating knowledge. Accordingly, knowledge management is the process of organizing knowledge to develop assets of an organization to achieve its vision, mission, and objectives. Some research showed that business organizations and educational institutions are deeply involved in developing, storing, sharing, and publishing knowledge continuously. Thereon, the writer aimed to describe how educational institutions establish knowledge management constantly, which begins with the definition of knowledge management, the knowledge management structure in higher educational institutions, the knowledge management model, innovative model of knowledge management, advantages of knowledge management for higher educational institutions, and establishing its model.

METHODS

This study used a literature review from international journal papers and books regarding definition of knowledge management, the knowledge management structure in higher educational institutions, the knowledge management model, innovative model of knowledge management, advantages of knowledge management for higher educational institutions, and establishing model of knowledge management constantly. Then, they were analyzed and chosen to support discussion in this paper.

RESULTS AND DISCUSSIONS

Educational institutions establish knowledge management constantly began by understanding people regarding the definition of knowledge management, the knowledge management structure in higher educational institutions, the knowledge management model, innovative model of knowledge management, advantages of knowledge management for higher educational institutions, and establishing its model. The explanation is as follow.

Definition of Knowledge Management

Lately, knowledge has been a very valuable asset of an organization in the business and academic world (Al-Shammari, 2008). If an organization tries to develop its knowledge, it must establish knowledge management (Goh, 2005). Yeh (2011) explained that it consists of some organizational components, including choosing, accumulating, having, organizing, sharing, and communicating knowledge. Meanwhile, Jashapara (2007) described that knowledge is divided into tacit and explicit knowledge). The former is knowledge inside the human brain according to the understanding, expertise, and experiences. The latter, on the other hand, is one documented in a real record or publication. The synergy between the two kinds of knowledge can make it easier for someone to share his/her individual knowledge with others. Knowledge management needs all processes related to identifying and sharing knowledge and making innovation. It also needs a system to acquire and store knowledge and facilitate learning processes of knowledge in an organization. Considering knowledge to be an asset to encourage organizational norms and values supporting the creating and sharing of knowledge with all members of the organization and general public will help an organization have success in establishing knowledge management (Ribiere & Tuggle, 2005).

Jashapara (2007) also stated that knowledge is divided into two levels, individual knowledge and organizational one. Regardless of different characteristics of each, both can make a significant contribution to an organization's competitiveness. Individual knowledge is absolutely in everyone's individual mind, while organizational knowledge includes explicit knowledge beside tacit knowledge which is similar to individual knowledge. To learn and acquire new knowledge, individuals of an organization have to communicate and share their own both tacit and explicit knowledge with other

members. Tacit knowledge forms in somebody's minds, behaviors, and perceptions, while explicit knowledge constitutes documents and is sharable through information technology.

Today most organizations use well-managed knowledge to achieve their organizational objectives and maintain their superiority over their rivals in the high competition. Kasemsap (2016) explained that knowledge management is a systematic process of collecting, sharing, applying, improving, and renewing knowledge for organizational purposes. Petrides and Nodine (2003) added that knowledge management contains basic elements including gaining new knowledge, sharing, and applying it, organizational cultures, and technological devices, which an organization use to provide learning process by higher standards.

Yogesh (2005) stated knowledge management is for any organization intended to have comprehensive knowledge of history of success and failures it or others achieved. Knowledge management is a process of capturing, sharing and effectively using organizational knowledge for the development of an organization (Davenport, 2010). According to Jurison (2001), it is an art to convert information and intellectual capital into enduring values of their stakeholders. Pillania (2008) defined knowledge management as a process within an organization which formulate and recognize knowledge and assists in the organization. Knowledge management processes, therefore, focus on the right knowledge for humans at the right time in the right format and for the right cost (Kidwell, Vander Linde, & Johnson, 2000). Fry et al. (2008) concluded an organization which increases its research capacity will extend and broaden knowledge within the organization, which results in better knowledge transfer among individuals within an organization and its networks. They suggested that higher educational institutions as academic organizations provide a curriculum which supports models and solutions reached from knowledge to gain knowledge of organization performances in order to increase efficiency, effectiveness, and innovations within the organization. The research result of Hegazy and Ghorab (2014) shows that applying knowledge management and organizational learning may lead to organizational innovations.

Jashapara (2005) mentioned that the range of knowledge management is strategies, practices, diffusion, techniques, perfect methodologies, and formal and informal processes. Knowledge management applied by an organization involves processes of identifying, creating, transferring, processing, analyzing, storing and distributing knowledge throughout the organization (Pillania, 2008). Bennet and Bennet (2008) added that the organization will still have expertise of knowledge management and intellectual capital despite organizational changes. There is a close connection between knowledge management and knowledge creation, knowledge retention, knowledge sharing, and utilization and the finding of tools of sharing the correct knowledge to make academicians be interconnected with each other.

A study has identified that knowledge management may increase an organization's capability, structure, culture, and technology. According to Chang and Chuang (2011), the information technology, management of human resources, leadership, organizational learning, organizational culture, organizational structure, and organizational strategy can be developed through knowledge management. In addition, by establishing knowledge management, an organization may develop its culture, leadership, processes, explicit, tacit, networks, market, measure, skills and infrastructure. What is more, according to Howell and Annansingh (2013), the distribution and sharing of new generation of knowledge make it possible for an organization to solve critical problems and make cultural transformation.

In sum, knowledge management can be defined as a process of collecting knowledge, transferring tacit and explicit knowledge, and sharing, storing, utilizing, and reusing knowledge. All the processes are vital to the success of the organization which has strong spirit of competition globally.

The Knowledge Management Structure in Higher Educational Institutions

Recognized that knowledge management implementation depends on the three organizational resources, human resources, processes, and technology, which all enable an organization to use information and share it more effectively (Xue, Liang, Hauser, & O'Hara, 2012). Higher educational institutions committing to educational missions have distributed knowledge to their students through students' sharing knowledge with other students, lecturers' sharing with students, book references and other sources. As educational organizations, they have always to face the same challenges as do non-profit organizations. The problem may be overcome through information and knowledge sharing among individuals within the organizations (Kasemsap, 2016). Davenport (2010) added that a technical system may help find data and information. Lately, higher educational institutions have realized the importance of technical capability and totally focused on information to facilitate the distribution of information and knowledge. It is important to specifically understand organizational contexts, organizational dynamics, and external pressures.

Knowledge management should be established in a human-oriented approach which considers an organization to be a complex system occurring from a unique context where it is developed. The approach should enable individuals within an organization to implement a set of practices to collect information of what they know leading to actions which can increase the result. To utilize and share information more effectively, Gupta et al. (2008) recommended that an organization should establish knowledge management unifying its three main resources, human resources, management processes, and technology it uses.

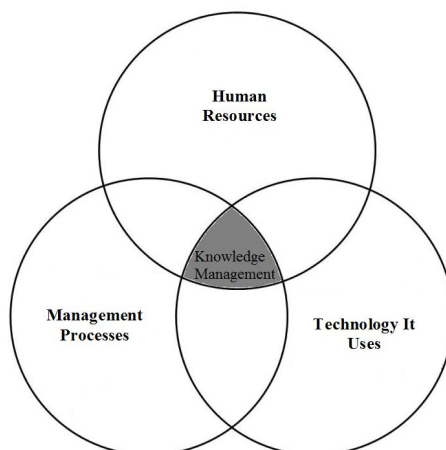


Figure 1. Knowledge Management Structure in Higher Educational Institutions

The Figure 1 shows that knowledge management in higher educational institutions must be established by their three main resources: human resources, management processes, and technology they use. It is aimed at using and sharing information and knowledge more effectively. The further explanation is as follows.

The first element, the human resource, includes those in higher educational institutions who manage knowledge. Higher educational institutions can promote policies and practices which help share and manage knowledge. Ribiere and Tuggle (2005) suggested that knowledge management can be established in a professional teamwork involving academicians from some academic fields to share what they know and learn. Activities involving many people from different disciplines and faculties in group discussions, meetings, seminars, and conferences can make the sharing and exchange of knowledge much easier. The group discussion will build up relationship, trust, and expertise by undertaking group activities concerning human resources, tools, and artifacts which support learning processes in the future. In many organizations, the informal activities could be discussing ideas of

knowledge improvement or conducting independent research. Exploring new ideas in person or groups is the main energy source of knowledge innovations. This will absolutely bring about far-reaching effect on more useful and effective works in higher educational institutions. However, little did leaders realize, accept and appreciate the importance of this condition. Knowledge management can encourage higher educational institutions to develop action groups for knowledge innovations.

The second component constitutes technology the institutions use. Technology should be an asset to manage, not a burden imposed on the institutions' limited resources. It can be a driver of knowledge management, but it needs important contributors to an organization's good condition and effectiveness. The most effective technology for knowledge management is the one accessible to a wider public of target users to promote and exchange information to all majors and administrative staffs in the institutions.

The last component is the management process stimulated by the institutions. It forms procedures for formal and informal administration, curriculum development processes, methods of sharing and publishing information, incentive payment, and any other processes influencing the flow of information within the institutions. Belfo (2013) added that this management process helps establish a standard for a strong process enabling individuals to get information they need. It can also help promote processes leading to taking right decision to see the utilization of ill-stated information.

Based on the explanation, it can be concluded that for higher educational institution to place a set of values needs a synergy of three main elements of knowledge management: human resources, management processes, and technology. Without following set patterns of an organization, new technology is sometimes ineffective to be adopted. Leaders of higher educational institutions need to improve their decision-making process, creativity and innovations in all majors and administration to develop knowledge management. The duty of the institutions is to manage knowledge to enhance students' knowledge results, behavior, and skills, so that it benefits all individuals within the institutions, stakeholders, and general public.

The Model of Knowledge Management

The establishment of knowledge management can enhance the quality of higher educational institutions and their graduates (Dhamdhare, 2015; Nawaz & Gomes, 2014; Ojo, 2016; Rajak, & Chandra, 2017). It is undertaken by refreshing their memories to analyze the effective use of technology, to draw attention of potential students, to build a transaction-based system, to publish reliable information widely, to be more competitive at national and international levels, and to satisfy students' needs whenever and wherever they are (Muhammed, Doll, & Deng, 2011).

Morgado, Ortuño, Yang, and Ferreras-Fernández (2014) also mentioned that people's more complex knowledge has demanded educational institutions to continuously develop, innovate, investigate, analyze, predict, and respond to possible opportunities and problems. All organizations store, access, and share knowledge by giving their products and services additional values, using the effective use of knowledge. The institutions should avoid conducting activities not related to education. Besides, their staffs should also base their assumption of their role in social changes on knowledge. The institutions should explicitly realize and manage processes related to the creation of their knowledge assets and acknowledge their intellectual capital to establish their crucial roles in social life and the global market for higher educational institutions.

Now they have more challenges to respond to, including economy of knowledge, change of social and economic system. Fry et al. (2008) explained that they have also been challenged to broaden knowledge and specific skills, create knowledge effectively, and improve good communication with industry to be center of research and provide highly qualified graduates. Higher educational institutions are society's main instruments to get knowledge; therefore, knowledge management there must provide a set of management connecting students, teachers, researchers,

business, and industry for technological processes. This focuses on how the institutions can promote strategies and practices which help other higher educational institutions to share, manage, and apply their knowledge. Yeh (2011) mentioned that there are two perspectives of knowledge management, that is, academic knowledge and organizational knowledge. The former is gained through learning-teaching activities and main goals of the institutions. Meanwhile, the organizational one refers to knowledge of overall efforts of the institutions which take into consideration powers, weaknesses, strategies, success-determining factors, and relations with research centers.

Knowledge management established by higher educational institutions is like a research (findings and acquisition), teaching (distributing and sharing), and libraries (applying and storing knowledge). Kidwell et al. (2000) stated that the success of this management program completely depends on an organization's strategies and cultures of creating and sharing knowledge and collaboration with other institutions establishing the management program. Knowledge management methods can be classified into five main categories: (1) research processes, (2) curriculum development processes, (3) student and alumnus services, (4) administrative services, and (5) strategic plans. Knowledge management is advantageous for higher educational institutions because the faculty development management, research processes, training processes, the curriculum development, learning and teaching activities, control of the organizational processes, strategic plans fulfill the need of curriculum design and curriculum transfer. This is highly instrumental in meeting relevant purposes and the quality of human resource development and ensuring that teaching and learning activities create a favorable environment for creativity and innovations. All of this need knowledge management techniques in the development of higher educational institutions' curriculum.

Research is one of the main duties of higher educational institutions. Research is means of knowledge creation and diffusion. The institutions pass knowledge to students and manage and record it for future references. To conduct a research, the institutions have to generate high motivation in all academicians including all members of faculties, staffs, and students, industry, parents and general public. They should make a major contribution to successful knowledge management. The facilitator of effective application of the knowledge management strategy is prospect, enthusiasm, and actions done in synergy with the organizational strategies. Technology has a significant role in transferring knowledge and facilitating the distribution of tacit and explicit knowledge.

According to Thorn (2001), the implication of knowledge management is a very wide region to be understood by higher educational institutions. Therefore, they have made policies, allocate education budgets, issue regulations, devise curriculum, encourage public participations, set an academic standard, and conduct some research to respond to present and future challenges and problems. Therein, the utilization of information technology is also needed to help distribute knowledge. As mentioned again and again, higher educational institutions establish knowledge management to support the achievement of their mission in creating pleasant environment for learning processes.

Most of the higher educational institutions have their own knowledge portals, used to distribute and connect academic communities and students worldwide. They use such technological media as e-business, electronic enablers, utility technologies, digital education and distance learning, electronic performance support systems, learning content management system, and learning management systems to distribute knowledge to their staffs and students.

Taylor (2005) defined that tacit knowledge is skills developed from learning-by-doing processes. Ribiere and Tuggle (2005) added that it can enhance intuition, creativity and spontaneous knowledge which can be used to overcome difficult problems. The growth of tacit knowledge can motivate students to achieve the success of their careers. Meanwhile, explicit knowledge needs to be carefully managed and systematically stored in database accessible by high configurations of the information system of higher educational institutions. The advantage of explicit knowledge is its accessibility to

both internal and external people. Thus, this kind of knowledge can be used in addition to the tacit one to solve the same problems.

Explicit knowledge documentation can be data or information facilitating theoretical principals. It can be easily codified, spread and passed on to students, being by various formal methods translate application knowledge such as patterns, equation, rules, theories, the best practices. Both kinds of knowledge may lead to knowledge results humans need from knowledge sources for strategic knowledge, using different methods and knowledge implementation. Then, this knowledge management model can be described such as Figure 2.

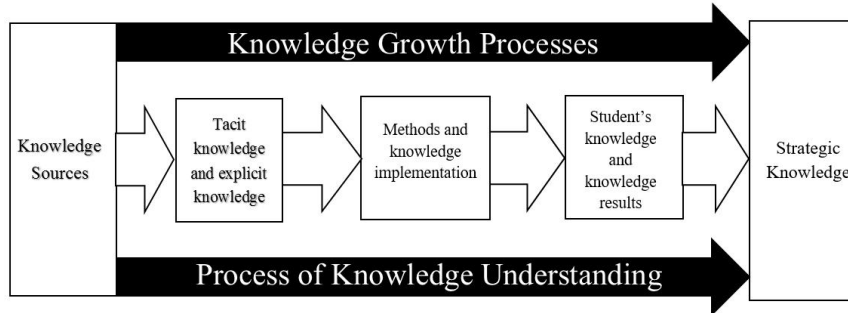


Figure 2. A Model of Knowledge Management

Figure 2, the knowledge management model was developed from Nonaka's knowledge management model (Nonaka & Takeuchi, 1995). This model is an attempt at giving a high-level conceptual representation of knowledge management and essentially considers knowledge management as a knowledge creation process. Knowledge growth processes came from knowledge sources becoming strategic knowledge. This growth happened through a process of knowledge understanding from students consisting of three stages: (1) Tacit knowledge and explicit knowledge; (2) Methods and knowledge implementation; and (3) Student's knowledge and knowledge results. This model is designed to simplify a way how to identify or reviewing an understanding of the process of acceptance of knowledge received by students in a clear, precise, correct and logical so that it will provide an understanding of knowledge toward strategies' to develop student's ideas which they have been received. This provides benefits for lecturers because they will understand better how to provide an understanding of knowledge to their students better. The goal is to provide students' knowledge impacts toward the development of science and technology in higher education institution.

Model of Knowledge Management Innovative

Through the flow of time, strategic knowledge has transformed into sophisticated strategic knowledge which is divided into two categories: (1) procedural knowledge and (2) metacognitive knowledge. The procedural knowledge refers to knowledge about how to do something and how to devise formula for skills, algorithm, techniques, and methods. The metacognitive knowledge, meanwhile, includes theoretical and conditional knowledge and individual knowledge to apply, analyze and evaluate. Subsequently, the growth process of students' knowledge and research knowledge results in a better conversion of innovation knowledge as shown in Figure 3.

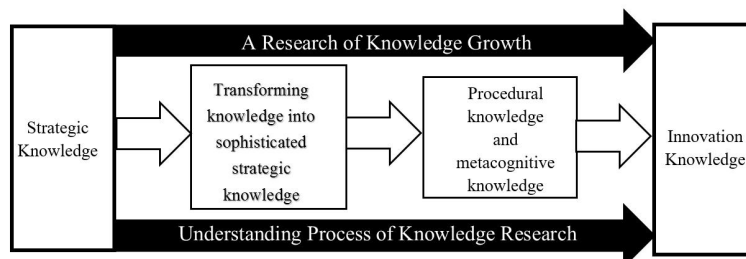


Figure 3. Model of the Growth of Innovation Knowledge

In Figure 3 shows that the formation of knowledge innovation occurs due to the knowledge growth is done through a research of strategic knowledge. This development happened it because students understand the process of knowledge research to produce a knowledge innovation explained by their lecturers. The understanding process of this knowledge research consisted of two stages. First stage is transformed knowledge into sophisticated strategic knowledge. Students need information technologies to know research results supporting their knowledge. They also require technologies' understanding to realize purposes that they wanted. Second stage is procedural knowledge and metacognitive knowledge. Students should make obviously procedures needed to undertake process the knowledge research to get research results of innovation knowledge. Meanwhile, metacognitive knowledge is used by students to know their project, how to apply, analyze and evaluate the research project undertaken.

For civilizing model in higher education institutions, this process needs to be carried out by lecturers continually and evaluated gradually to produce a result of the development of knowledge research undertaken by lecturers and students. The idea of innovation model was developed from an earlier idea from Nonaka's knowledge management model (Nonaka & Takeuchi, 1995). Although this model idea has not been validated before, however, this model is based on logical reasoning how lecturers provide a science and knowledge to students and how students develop their knowledge about new innovation to generate knowledge that can be useful for academic and community both nationally and internationally.

Advantages of Knowledge Management for Higher Educational Institutions

The establishment of knowledge management brings some profits for higher educational institutions. These advantages benefit in (1) extending service to students, staffs, faculty members, alumni, and general public, (2) shortening time of finishing research activities, (3), encouraging institutions to conduct interdisciplinary research, (4), enhancing competitiveness and ability to respond to research proposals, collaboration, and opportunities of new venture, (5) improving the quality of institutional research in the future, (6) enhancing competitiveness and ability to respond to students' research, (7) reducing administrative budgets, (8) facilitating interdisciplinary research, (9) enhancing the quality of developing and revising the knowledge management curriculum, and (10) increasing capabilities of human resources, customers, organizations, innovations, and financial and intellectual capital.

Besides, establishing knowledge management gradually may provide researchers of higher educational institutions with some other advantages, including (1) good thinking, (2) managerial and analytical skills leading to innovation and creativity, (3) ability to build awareness of future demands of environmental changes, (4) development of trusts among researchers, (5) ability to measure risks and to face them, (6) researchers' sharing knowledge, skills and ideas with other people from whom researchers can learn, and (7) good performances of productivity, quality, innovation and professionalism for higher educational institutions. In addition, knowledge management enables researchers build higher educational institution as center of value setting and strategic facilitators and competitors, and they may offer good service to students, graduates, staffs, and faculty members. What is more, they can raise the best quality especially for research in higher educational institutions.

Establishing Model of Knowledge Management Constantly

As knowledge-based institutions, higher educational institutions and industry generally facilitate very good characteristics of researchers' knowledge, including strategic, managerial, and operational characteristics. Their knowledge leads to the best practices by gaining knowledge from any sources,

and later sharing, distributing, storing, reusing it, and then making innovation. Higher educational institutions should devise research-oriented curriculum for students' future careers. They may integrate the mechanism into their curriculum to bear researchers' knowledge always resulting in innovation knowledge.

To serve this purpose, they should establish knowledge management in their institutions. Figure 4 shows how to gradually establish knowledge management which integrates understanding of knowledge comprehension process and the process of creation innovation knowledge.

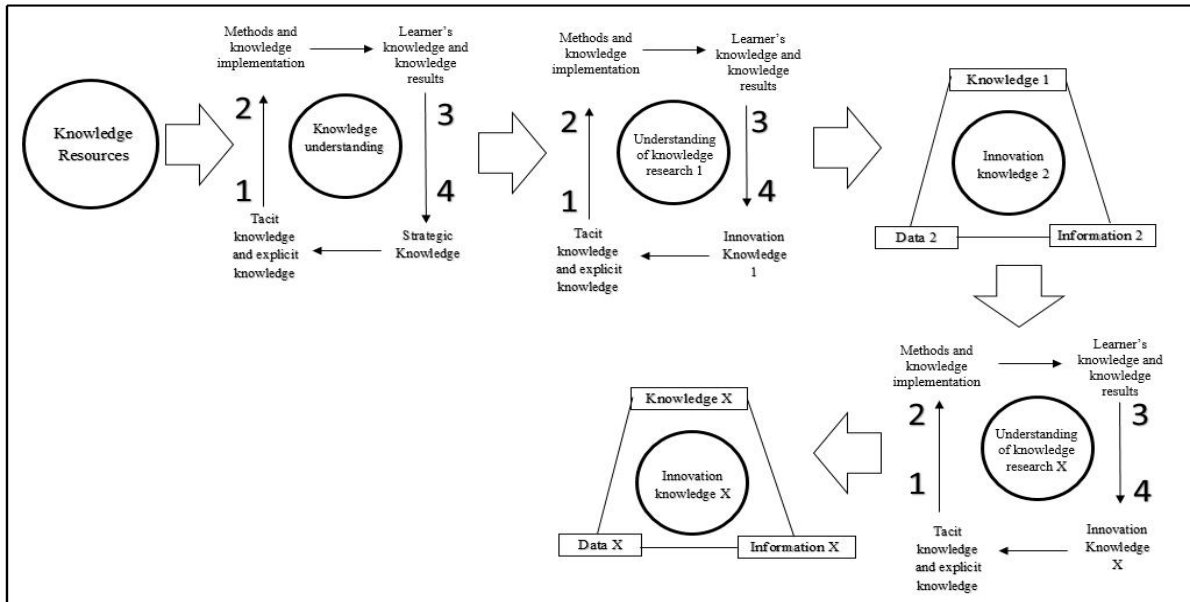


Figure 4. The Model of Gradual Knowledge Management in Higher Educational Institution

Figure 4 shows the gradual establishment process of knowledge management model which can be applied in higher educational institutions. It is a combination of knowledge management model (Figure 2) and a model of the formation of innovation knowledge (Figure 3). The process begins with knowledge sources and is consecutively followed by the knowledge understanding, the understanding of knowledge research 1, innovation knowledge 2, the understanding of knowledge research X, and innovation knowledge X. The X constitutes the number of processes undertaken gradually. The knowledge understanding process consists of tacit and explicit knowledge, method and application knowledge, learning knowledge and knowledge results, and strategic knowledge. The understanding process of knowledge result involves 4 steps: knowledge of strategies, the distribution of knowledge and knowledge of advanced strategies, procedural and metacognitive knowledge, and innovation knowledge, which results from data, information, and knowledge.

It is suggested that the model of Figure 4 is a useful means for structuring further innovation knowledge research into the field of knowledge and technology growth as it can be used to balance between old and new knowledge paradigms. It allows knowledge and technology to be associated with the emerging social paradigm while at the same time contributing to the current paradigm.

CONCLUSION

Gradual knowledge management is an important approach for higher educational institutions to conduct a research practically useful for students, faculty members, staffs, alumni, stakeholders, and general public. The institutions must focus on the encouragement and development of superior knowledge researchers in more competitive global market world. Therefore, they have to identify all

important aspects to establish programs based on quality research which can make their students become knowledge researchers.

Besides, students and teachers need to make a lifetime commitment on education in order to maintain and improve their knowledge. Higher educational institutions have to concentrate on the gradual establishment of knowledge management by considering process-related elements. Commitments to establish knowledge management for positive research results deeply depend on those of leaders of higher educational institutions and stakeholders through providing education budgets, tools, information technology, motivation and incentives. Equally, the commitments of students, faculty members, staffs, alumni, stakeholders, and general public are in a great need.

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