

Knowledge Management Competencies Development of Students in the 21st Century

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Abstract

Students in the 21st century should be developed to perform the necessary operations to be a great member in learning organization. Knowledge management is a core competency for workforce in every organization. This enables person in various functions to carry out their performance effectively. There are including knowledge storage publishing and sharing embedded knowledge of organizational which are the explicit knowledge to lead the organization to the sustainable development. This research aims to analyze and synthesis ideas about knowledge management competencies of students in the 21st century by document research and analyzed by content analysis from books, articles, documents, web sites and related research since year 1963-2013 total 140 items.

The results showed that the elements of knowledge management are (1) People (2) Technologies (3) Knowledge management process and (4) Leadership. The core competencies in the knowledge management of undergraduate students in the 21st century include nine competencies which are (1) Principles of knowledge management knowledge (2) Understanding of information technologies (3) Knowledge capture skills which existing in a person or document (4) Knowledge management skill within person or the system. (5) Interpersonal communication skills (6) Knowledge sharing skills (7) Problem solving skills. (8) Moral consciousness and (9) Responsibilities to share knowledge.

Keywords: Competency, Knowledge management, Knowledge management competencies, Student. Higher Education, Higher Education Students, 21st Century, 21st Century student, 21st Century Higher Education Student.

Introduction

The main key to success of organizations in the 21st century is the ability to manage and create knowledge since knowledge is the most valuable intellectual asset of organizations (Prusak, 1998). The vision, the knowledge, the ideas and the creation of a systematic learning culture will lead to the development and advancement of organizations' operations. In order to support and encourage an organization's personnel to learn continuously and efficiently under the concept of cooperation and co-learning, which will enable the organization to reach a common goal (Senge, 1990), all business organizations agree that the important tool that is needed is knowledge that has been collected in the companies, which can also be referred to as knowledge assets (Wiig, 1997). Knowledge management, therefore, is essential for the systematization and understanding regarding the search for knowledge from textbooks, databases or documents as a way to develop human resources in that organization so that they can discover new products which will allow the bodies of knowledge to reach the highest goals (Thomas, Kellogg, and, 2001). Therefore, organizations need to have personnel with the capabilities of knowledge management, the knowhow of related technologies and the personal experience of familiarity with basic business procedures (Davenport, and Laurence, 1998).

In this scenario, the duty of higher education organizations is to cooperate with the manufacturing sector, both industrial sectors and spatial industry groups, to provide knowledge and develop skills for the labor in preparation for entering into the manufacturing sector. In terms of the basic learning structure, higher education institutions must realize that their future education is both "the preparation for human beings to live their lives and the adjustment of people to commence their work." Higher education institutions have a mechanism for the creation of knowledge, wisdom and human resources for the propulsion of society and the economy of a country. The quality and the efficiency of higher education institutions are, therefore, the indicators of the country as well as the society's expected sources of quality human resource production, which create people with competence, expertise and professionalism for the society at present.

The development of knowledge management competencies ever since students have studied in higher education institutions is, therefore, still of utmost importance nowadays. This is because students are expected to become the country's leaders, academically and socially; that is, to utilize the branches of knowledge that they have studied with responsibility (Chaiyupatham, 2007). This idea is in accordance with the opinion of Perry (1970), who pointed out that the development of students indicated by their positions is an indication of their level of advancement. This process will happen continually throughout students' lives. After they graduate and enter their working life, their employers expect them to be able to integrate and create new bodies of knowledge for the smoothness of operation the business and for living in a constantly changing society. Ever since university days, the development of knowledge management competencies is the accumulation of bodies of knowledge concerning knowledge management by the methods of distributing knowledge, enhancing skills and developing knowledge management competencies. As a result, students will learn and understand knowledge management and are able to learn from one another.

Knowledge management competencies mean knowledge, skills, abilities and behaviors of people in organizations, which are developed through knowledge-

building activities organized by experts in different fields. Knowledge management competencies development is a major tool that brings the graduates to join public and private agencies. These agencies will develop into learning organizations, and the knowledge will be further enhanced intellectually, making people in the organizations more knowledgeable. As a result, the organizations will become stronger and turn into agencies that can truly direct the development. Thus, the development of knowledge management competencies requires cooperation from everyone in an organization who should also give creative suggestions for the sharing of knowledge through the procedure of dialogue, discussion and community of practice.

The competencies of students in the 21st century need to be developed by the knowledge from the core curriculum created from basic subjects. By combining it with a framework of supportive systems, including the standard of subjects, the evaluation of curriculum, professional development and the provision of learning atmosphere (The Partnership for 21st Century Skills, as referred to in Areesophonpichet, 2010).

Currently, knowledge management uses technology as a tool, which is called a knowledge management system for the development of basic structure of knowledge in organizations into the knowledge that benefits people in the period of time and in the pattern that they want (Namprasertchai, 2003). Knowledge management technology is related to organizational development. If an organization wishes to develop itself into a learning organization, it needs to focus on knowledge management with an emphasis on various factors in the management of the knowledge-based system. It is an ability to gather bodies of knowledge that are scattered in many forms and organize them for utilization. The knowledge management strategy in a business organization in the form of "Pull Model" is used as real-time knowledge management. Also, there are many channels of knowledge management in the real-time system.

Hence, knowledge management competencies of students in the 21st century must be developed in order to create efficient knowledge managers for different organizations in the our future society. This is because students are the country's major force. At this age, they are in search of knowledge, experience as well as indoctrination of cultures, attitudes and values. Therefore, this is an important age for people to develop into complete human beings who will continue to serve the society. The ability to manage knowledge will lead organizations to their goals.

Objective

The objective of this research is to analyze and synthesize the concept of knowledge management competencies development of students in the 21st century.

Research procedure

This academic work is a qualitative research conducted by the study of documents in order to analyze and synthesize bodies of knowledge regarding knowledge management competencies of undergraduate students. This research focuses on the study of the main competency, which is an ability to manage knowledge of students who are equipped with knowledge, skills and ability to relate causes and effects of efficient operations individually by content analysis of 140 textbooks, articles, documents, electronic documents and relevant research from 1963 to 2013. Then, the

concept of knowledge management competencies development of students in the 21st century is concluded by content analysis, which helps to sum up and analyze the qualitative data.

The results of the research

Presently, students who have graduated are called the graduates who are getting prepared to enter their working life. Students at this age are completely mature. They are seekers of experience until they are filled with knowledge and ready to produce more knowledge by developing themselves. They are interested in specific branches according to their experiences and put an emphasis on the problem-solving procedures, participation in learning activities as well as the distribution of knowledge and experience of students who are the major force of the country. At this age, they are seeking knowledge and experience in order to change and improve beliefs, values and attitudes. They are at the top of educational levels and are getting prepared to serve society. The desirable competencies of graduates in the 21st century include various skills, knowledge and elements that learners can use in their working life and their lives outside universities. They are the combination of knowledge, specific skills, expertise and understanding.

The competencies of learners in the 21st century must be the development of knowledge from the core curriculum of universities, which is created by basic subjects. After educational institutions create a basic curriculum by combining it with the framework of a supporting system, which comprises the standard of subjects, the evaluation, the curriculum and teaching, the professional development and the provision of learning environment, learners will participate in the learning procedure. It is also a preparation for utilization after graduation in an economic-based society in the future.

The elements of knowledge management competencies development of students in the 21st century that the researcher has found are:

1. Definition of competencies
2. Elements of competencies
3. Evaluation of competencies
4. Definition of knowledge management competencies
5. Desirable competencies of students in the 21st century
6. Knowledge management competencies of students in the 21st century

The details are as follows:

Meaning and definition of competencies

Competency is an ability to work and to live sufficiently. It has the characteristics of a noun and a verb that can be used interchangeably by the expression of individual capability. Thus, competency means a group of knowledge, skills, ability and characteristics, which are connected to each other and have an effect on a person's behavior, resulting in the relationship between work competencies of an individual according to the career standard. They can be evaluated in comparison with the standard and gain acceptance, and they can be created by training and developmental plans. Thus, it is important to define competencies in operations in order to allow employees to succeed in reaching the organization's targeted goals and to support competencies in competition between business organizations nowadays.

Elements of competency

Elements of competency are the ability to determine competency level by measuring the performance of individuals. Elements of competency consist of (1) competency names and definitions, (2) competency cluster to classify behaviors of work according to the competence cluster and core competency and professional competency determined for each group to encourage appropriate behavior to functions, (3) three competency levels, covering positive behavior, neutral behavior, and negative behavior, and (4) behavioral indicators which are role and duty under specific circumstances.

Competency Evaluation

Competency evaluation was divided into three major groups: (1) Tests of Performance is a test for the testees under certain conditions. Behavior Observations is a test related to the behavior observations of the testees for certain situations and (2) Self-Reports is a test where the respondents reported on themselves such as feelings, attitudes, beliefs, interests, personality test, questionnaire, on a survey form by using different evaluation methods such as (1) individual evaluator, (2) methods for making a self-assessment and conclusion of evaluation result together with evaluators, and (3) several evaluators such as 360 degree have more than one evaluator and consist of commander, colleagues, and subordinates. The score evaluation from many evaluators would be determined by using the scale as criteria of at least four patterns. The measure was appropriately developed as the understanding of personalities and such measures must have the power for classification under the competency level such as the 1st measure is to consider the percentage of behavior, the 2nd measure is to consider the strength of testees, the 3rd is to consider competency of the testees compared to a good model of other people, and the 4th measure is to refer competency of personalities of the same level by using the measurement of competency evaluation. For the 4th measure, the scales consists of (1) rating scale or behavior level for reference, (2) bar scale using behavior competency in a dictionary as the scale for evaluation, and (3) hybrid scale combining the use of behavior competency as a basic measurement to measure a combination of the performance behavior when competency level is evaluated.

Definition of knowledge management competency

Management competency is presently acknowledged as important for modern society because changes in society result in greater demand, and further sharing of knowledge. Competency and knowledge management are significant for individuals and organizations. Many definitions depend on the place and the use of each situation. Therefore, knowledge management competency means knowledge, skill, and property of personalities in the organization in terms of knowledge management. It consists of (1) knowledge of principles, (2) cognition of technology, (3) knowledge of information, (4) skills of the knowledge identification, (5) skills of interpersonal communication, (6) skills of knowledge management, and (7) sharing knowledge.

Students who have recently graduated are called new graduates to prepare for a working society. Students in this age have completed maturity. They seek experience until they have full sources of learning and are ready to increase the productivity of knowledge as self-development. They are interested in a specific field regarding their existing experiences and they focus on the problem solving, participate in learning activities, and provide knowledge. Desirable competency of students in the 21st

century requires awareness of skills, knowledge, and elements so that students can apply them to their working and personal lives outside the university. It is a combination of knowledge, specific skills, expertise, and cognition skills.

Desirable competency of students in the 21st century

Desirable competency of students in the 21st century is a special condition linking students in the 21st century to achieve education and working in the era of technology and change consisting of many factors as follows:

1. Basic literacy is to be able to have linguistic and mathematical capabilities in order to accomplish work efficiently. Scientific Literacy is knowledge and understanding of conceptual knowledge and scientific methods required as information for making decisions and participation in a social system. Economic Literacy is to understand economy, measurement and anticipation for changes in terms of economics and public policy, balance of expenses and benefits. Technological Literacy is knowledge and ability to effectively and efficiently use technology to achieve the determined goal. Visual Literacy is the ability to use interpretation, creation of media for the development of thinking, decision-making, communication and learning. Information Literacy is capable of evaluation, information access, analysis, efficient use of information by effectively using technology to support their success. Multicultural Literacy is knowledge and understanding of the similarities and differences between formal procedures, values, and beliefs of their own culture and others. Global awareness Literacy is ability to remember and understand relationships among countries.

2. Inventive thinking due to technology resulting in present living becoming simple. Creation and thinking invention will upgrade existing skills and abilities and it is necessary for it to consist of adaptability and managing complexity. Self-Direction is ability to set goals related to learning, curiosity, creativity, risking, higher-order thinking and sound reasoning.

3. Effective communication is an essential skill required in the 21st century (21st Century Literacy Summit, 2002). The meeting concluded that Effective communication skills would result in success in knowledge based society. Communication skill consists of teamwork, interpersonal skills, personal responsibility, social civic responsibility, and interactive communication.

4. High productivity in current work containing information and knowledge from the use of technology. This will result in the person failing or achieving success in work depending on the following elements: prioritizing planning and managing for results, effective use of real world tools, ability to produce relevant, high-quality products.

It was found that more than 50% of students in the 21st century had desirable competency. The institutions indicated that desirable competency included the following properties: (1) Knowledge, conceptual principles, academic and professional skills can supplement and develop the professional knowledge. (2) Potential to learn and seek for knowledge is ability to access information and knowledge, to seek for knowledge sources accurately and effectively (3) Global awareness literacy is ability to remember and understand the relationships among countries (4) Curiosity is expression of desire to know or eagerness to know what a person is interested in. (5) Teaming and Collaboration is ability to coordinate with more than one person, work with others to solve problems, create new things or learn

and model for others. (6) Interpersonal skills means ability to understand and deal with their own emotions and those of others, great motivation and interaction within a society. (7) Social & civic responsibility means to manage and control the use of technology in the public and protect society, environment and democracy. (8) Foreign language skills sufficient for utilization and high level for academic learning. (9) Appropriate values for living such as adherence to the principles of sufficiency economy, democracy, respect for human dignity, and self-dependence. (10) Conscious of virtue, morality, and honesty which are necessary for living and expression in behavior such as self-discipline, adherence to professional ethics, honesty, avoidance of vice and drugs, conscious of social participation. (11) Ability to take care of their physical and mental health. (12) Creativity and innovation is ability to use new and innovative techniques, work creativity with others to develop, implement and communicate new ideas to others openly and respond to new perspectives within the group, response to the input and output feedbacks, present original things and create new things in a workplace, to understand the global limitations to adapt new ideas and utilize new innovations for assets and benefits. (13) Higher-order thinking and Sound reasoning is ability to adapt for appropriate criticism, comparison, interpretation, evaluation, and synthesis for academics and solutions. (14) Prioritizing Planning and Managing for results means ability to manage different things to meet the objectives of the determined project or problem faced. (15) Effective use of real world tools is ability to use modern tools (such as hardware, software, networks or devices connected to a computer used by information technology officers suitable for current world. (16) Problem-solving skills; identification, determination, solutions, definition for problem content, systematical analysis by applying existing knowledge. And (17) Students must have accurate and great sacrifice, dedication, to the common interest.

Knowledge management competency of students in the 21st century

Management knowledge is to help a person discover knowledge, skills hidden in people, find a way to share knowledge, appropriately supplement and implement to real situations, build knowledge or new innovations, contribute mutual learning of all people involved in the process resulting in successful solution and development of difficult tasks. Knowledge management means knowledge creation, knowledge collection in persons or documents to systematically develop and manage to provide knowledge, exchange knowledge, and appropriately apply to real situations, build knowledge or innovations for everyone to access knowledge and develop themselves to be experts, efficiently operate work to develop ability of business growth effectively and sustainably including highest potential for competitiveness.

Elements of knowledge management are tools to develop performance of personal in the organization to achieve the targeted goals consisting of (1) people who utilize knowledge,

(2) technology, a tool for people to search for, store, exchange, and apply knowledge easily and swiftly such as transforming data to information, transform information to knowledge and use of knowledge for action, (3) processes to exchange knowledge for efficient operation in a workplace by using a good plan resulted from policy, apply knowledge, observation, data collection and transformation as information, and (4) leadership to support and participate in the activities of knowledge management, which is a property to push knowledge management in successful organizations.

Process knowledge management is general in many organizations, both knowledge of persons and organizations to conform and response to visions, targets, and objectives of the organization resulting in learning system of personal so that they can mutually learn, search for, share and transfer knowledge for knowledge existence and development within the organization as valued intellectual property. It can be applied to develop performance to efficiently achieve the operational objectives of the organization. The main processes of knowledge management cover (1) knowledge of experts in each field, (2) management processes to maintain knowledge, activities, or systems, (3) knowledge collection, (4) knowledge sharing, and (5) knowledge application.

Currently, business organizations integrate knowledge management and technology in the work process by managing the original information technology or "Push Model". It is putting information into the system. However, strategy for knowledge management in organizations needs to be adapted by using the knowledge management model or "Pull Model". It is knowledge utilization in the form of Real time knowledge management. Knowledge management by using information technology as a tool to develop the infrastructure of the organization as benefits for personal in required time and the model is called knowledge management systems. Elements of knowledge management systems consist of (1) technology for storing information technology, computer servers, various information sources, including providing information such as external knowledge, structured and information internal knowledge to the relevant department, (2) platform of collaboration, system and database resources for collaboration and support are required, (3) infrastructure network as network system supporting communication and conservation, and (4) culture, for example, organizational culture results in mutual exchange and use of information.

At present a knowledge management system is a core component of website or electronic communication networks. To present useful information for people interested in both public and government sectors, officers or executives concerned should be able to search and access data sources across domains effectively. There are various channels by which data and information can flow, including: Data Collection, Concept library, E-learning, Collaboration technology, Collection technology, Storage technology, Intranet, Groupware platforms such as Customer Relationship Management infrastructure or Business support system business units, Web-boards and Systems Software

Thus, a knowledge management capability of students in the 21st Century would imply that the core competency of the students involves the ability to perform knowledge management tasks - including knowledge skills and logical qualification of determining whether there is an actual cause-and-effect relationship for operational effectiveness to meet the goals on an individual basis by establishing an acceptable performance to meet the criteria specified for the role and response. There are three components of nine capabilities as follows:

1. Knowledge Competencies consists of the following capabilities: (1) the capability to have a clear understanding of the principles of knowledge management, (2) the capability to have a clear understanding the information technology.
2. Knowledge Management Competencies consists of the following capabilities: (1) having skill in knowledge indication, collecting existing knowledge that is inherently in people or documents, understanding and ability to assess their knowledge, and

seeking new ideas and evidence from extensive knowledge sources, (2) having skill in systematic management of knowledge that is inherently in people or documents, (3) having communication skills, great interaction, effective teamwork and good collaboration, (4) having skill in knowledge sharing by using technology as a tool for searching, collection, retention and knowledge sharing, both internal and external, and (5) having skills in systemic thinking, rationality and complex problem solving ability.

3. Qualification in Knowledge Management consists of the following features: (1) consciousness of moral, ethical and integrity in knowledge management, and (2) responsibility in knowledge sharing for the benefit of the society and community.

Discussing Research Findings

Lehtonen (2009) studied in Nonaka's knowledge creation theory revisited: a semiotic analysis of communicating knowledge in a geographically dispersed team in the University of International Business of Misteri found that there were six components affecting knowledge communication including language, cooperative relationship between people, attitude toward knowledge sharing, organizational environment and trust.

Dhamasiri (2000) explored in Learning Organization Model development through the human resources development department in the extension in higher education. In this study, the executive opinion surveys are used as the data collection tool. The surveys were distributed to the higher education institutions in both public and private sectors related to the subsystems in the organization to evaluate the following aspects; organization vision and strategy, general practice of top, intermediate, and lower-level executives, atmosphere in the workplace, structure of the organization and roles in the organization, information dissemination, independent practice and practice as a team, work processes, goals and performance, training and education, rewards and praise, personal and team development. The results revealed that the current conditions of Thai organizations have an intermediate level of Learning Organization. Moreover, the study indicated that Thai nature that is conducive towards the Learning Organization includes the ability to have adaptability to changing circumstances and the chance to learn what to do and how to that which is required to achieve the study objectives as well as having sensitivity to other people's feelings. On the other hand, the factors of Thai nature that are not conducive towards the Learning Organization are the favor of centralization, lack of initiative, following orders and avoiding responsibility, indirectness and inability to express feelings clearly. The author proposed the human resource development department model as the main factor leading to the organizations change and transition into the Learning Organization. The model consists of three main components including (1) twelve subsystems in three dimensions including leadership, structure and working system, performance and development as well as the natures which are conducive and not conducive to the Learning Organization, (2) the development division must perform in terms of curriculum development and instructional design to improve personal competencies, systematic thinking, learning as a team, mental imagery, common vision and leadership by using six courses including communication skills, employee empowerment, creative thinking and problem resolving, leadership development to changes and thinking skills development, (3) leadership roles in stimulating and improving communication of information, demonstration, training, supporting and instilling these skills.

McAdam (2001) studied about SMEs (less than 250 people) and large (more than 250 people) organization perceptions of knowledge management, knowledge implementation and the investment in knowledge management system and found that there were more perceptions and knowledge implementation in the larger organizations than in those of SME organizations. Furthermore, it was found that SME organizations have less investment in operational and knowledge management system than larger ones.

The model as proposed by Nonaka and Takeuchi (1995) has been used in the development of knowledge management model. It was the creation of knowledge as part of knowledge management capabilities involved in quality and knowledge processes improvement. Moreover, the organization focus on people through performance development and knowledge management. However, the components affecting the assessment of individual knowledge management capability development depend on personality, and working environment should be measured by individual performance based on performance standards for each duty of the organizations along with knowledge management capability development for the sake of implementing it as reference information to create an organization's staff development activities.

Guideline of knowledge management capability development for students

Knowledge management capability consists of three components with nine capabilities including competency, knowledge, skill and attitude, which can further development as the model of knowledge management capability development for undergraduate students. By survey interviewing current conditions of knowledge management problems in organizations and undergraduate students in the higher education institutions, the research findings have been used as the guideline for a proposal of the knowledge management capability development model for the undergraduate students, which consists of principles, objective, expected learning outcome, essential learning, activities management process and model performance assessment. Moreover, it should be used as instruction for a knowledge management capability development model for undergraduate students for maximum effectiveness.

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References

- Areesophonpichet, S. (2010). *National Qualifications Framework: Case Study International Qualification Framework*. Research Report. Office of the Education Council. Education Ministry of Education.
- Chaiyoopatham, A. (2007). *The Development of Undergraduate Student's Skills. Doctoral Research. Higher Education Faculty of Education*. Chulalongkorn University.
- Chickering and Reisser. (1993). *Education and Identity*. 2nd.ed. Sand Francisco: Jossey Bass.
- Davenport, T.H. and Prusak, L. (1998). *Working Knowledge Management*. USA: Harvard Business School Press.
- Dhamasiri, M. (2000). *Developing a Learning Organization Model Via Human Resource Development Unit as an Extension of Higher Education*. Doctor of Philosophy in Higher Education. Chulalongkorn University.
- Lehtonen, M. and Maisterin, T. T. (2009). *International Business Communication*. Lehtonen, M., *Nonaka's Knowledge Creation Theory Revisited : A Semiotic Analysis of Communicating Knowledge in a Geographically Dispersed Team*. International Business Communication Maisterin tutkinnon tutkielma. Helsinki School of Economics.
- McAdam, R. and Reid, R. (2001). SME and Large Organisation Perceptions of Knowledge Management: Comparisons and Contrasts. *Journal of Knowledge Management*, Vol. 5 Issue 3, pp.231 – 241.
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge Creating Company*. Oxford University Press, New York, NY.
- Numprasertchai, S. (2003). *Technology and Knowledge management, Microcomputer* (June: p.103-107)
- Pawaseena, P. (2004). *Knowledge Management*. [Online] Available from: <http://www.cpss.ac.th/km002.pdf>
- Perry, William G., Jr. (1970). *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. (New York: Holt, Rinehart, and Winston.)
- Senge, P.M. (1990). *The Fifth Discipline: The art & practice of the Learning Organization*. London: Century Business.
- Thomas, J.C., Kellogg, W.A, Erickson, T. (2001). *The Knowledge Management Puzzle: Human and Social Factors in Knowledge Management*. IBM Systems Journal 40 (4): 863–884. doi:10.1147/sj.404.0863.
- Wiig, K. M. (1997). Knowledge Management: An Introduction and Perspective, *The Journal of Knowledge Management*, Volume 1, Number 1, September 1997. Knowledgebase system: "KBSI" [Online] Available from: <http://www.kbsi.com/KBSICapabilities.pdf> [2011, Jan 20]

