Virtual Community of Practice using Human Performance Technology to Enhance Innovation Competency and Innovation for High Performance Organization

Purita Sayavaranont, Pallop Piriyasurawong

King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

Abstract **- This paper is a report on the findings from the research and development of Virtual Community of Practice using Human Performance Technology to Enhance Innovation Competency and Innovation for High Performance Organization. The purposes of this study are: 1) to develop a model; 2) to evaluate the proposed model using educational experts. The research was conducted through a qualitative methodology with an online five-point Likert scale survey tool along with thirteen experts. All experts agreed that the model was very strongly appropriate ($\bar{x}$ = 4.42, S.D. = 0.62), and suitable to increase innovationand improve innovation as a competency.**

Keywords **– Human Performance Technology; Virtual Community of Practice; Human-Centered Design; Innovation Competency; Innovation; and High-Performance Organization.**

1. Introduction

1.1. Disruption and global challenges

One of the defining characteristics regarding the globalised, technology - dependent world we live in today is the rapid development of diverse technologies.

DOI: 10.18421/TEM84-51
https://dx.doi.org/10.18421/TEM84-51

Corresponding author: Purita Sayavaranont,
King Mongkut's University of Technology North Bangkok, Bangkok, Thailand
Email: *purita1@gmail.com*

Received: 03 April 2019.
Revised: 18 August 2019.
Accepted: 30 August 2019.
Published: 30 November 2019.

These technologies are, in part, what has led to the massive surge in competitiveness within the private sector. The relationship between the two is rather like a repetitive cycle: the development of technologies provides means for people to build start-up companies and for existing companies to develop their infrastructure and product offerings. In turn, the increased number of players in the market or industry leads to a higher level of competitiveness, with each company trying to outdo the other in terms of innovation and technological advancements (which leads back to the development of technologies enabling more companies to enter the market). This enhanced competitiveness necessitates a capable workforce, which employees have to develop themselves just as quickly as the technology surrounding them does, leading to organizations that are better prepared, more responsive, and more innovative than ever before.

Transforming available manpower and resources into high performers has become a vital agenda. High Performance Organizations, also known as HPOs, are instrumental in nurturing talent and fostering innovation within a society. One of the ways that an organisation can take advantage regarding technology, is to help it gain or retain its status as an HPO, that is, to embrace virtual training.

This paper aims to foster and enhance innovation for High Performance Organizations through developing a Virtual Community of Practice using the Human Performance Technology Model. A conceptual framework has been created for the model, with the purpose of the model being examined to see if the model was able to significantly improve an organization's overall innovative capacity.

2. Research Objectives and Framework

2.1. Research Objectives

To develop and evaluate the Virtual Community of Practice using Human Performance Technology Model to Enhance Innovation Competency and Innovation for High Performance Organization.

2.2. Procedure of the Research

Phase1: Study and analyze current global trend and issues, e.g. technology disruption, global competitiveness and future workforce.

Phase2:Literature and research review on key elements,i.e. Human Performance Technology (HPT); Virtual Community of Practice (VCoP); Human Centred-Design (HCD); Innovation Competency; Innovation; High Performance Organization (HPO).

Phase 3: Develop the model based on literature and research review.

Phase 4: Evaluation of the model through an online five-point Likert scale survey method.

2.3. *Literature and Research Review*

2.3.1. Human Performance Technology (HPT)

Human Performance Technology (HPT) was defined as"a systematic approach to improving productivity and competence, it uses a set of methods and procedures -- and a strategy for solving problems -- for realising opportunities related to the performance of people." It is mainly focused on analysis of the performance improvement process, which begins with a comparison of the present and the desired levels of individual and organisational performance, in order to identify the performance gap. Once the performance gap and the causes have been determined, the appropriate interventions for improving performance are designed and developed. This guides the change management process afterwards, and evaluates the results [1].

For this study, Human Performance Technology is defined as a practical approach to improve human performance by creating effective solutions through analyzing the gap between as-is and to-be statuses, designing and developing human performance management systems with no traditional training or in class learning. On the other hand, that can be done through other approaches such as on the work design, e-mentor, coaching and sharing.

In order to fulfil the objectives of this study, the researcher adopted the following five phases of the HPT framework, which included:
1)Performance Analysis of Need or Opportunities; 2) Cause Analysis; 3) Intervention Selection, Design and Development; 4) Intervention Implementation and Maintenance; and 5) Evaluations [2].

2.3.2. Virtual Community of Practise (VCoPs)

CoPs is defined as "a group of people who come together to share common interests and goals, with the aim of sharing information, developing knowledge, and developing themselves both personally and professionally" [3]. The community enables newcomers to learn through interacting, and gaining support from peers or more experienced colleagues (also referred to as "old-timers") through simple tasks. This situated learning journey, based on constructivism and social interaction helps transform a relatively inexperienced newcomer to an eventual expert; this is called "legitimated peripheral learning". The role of social interaction dimension of situated learning also referred to three dimensions: joint enterprise – the process in which community members are engaged and working together toward a common goal [4]; mutual engagement – norms and social interactions created by members leading to the creation of shared meaning on issues or problems; and shared repertoire – common resources that were used to facilitate learning within the community [5].

CoPs can be conducted either face-to-face or virtually on the degree of reliance on ICT. The degree of reliance on ICT is the only feature that distinguished face-to-face from virtual (web-based) communities. Several literature reviews agreed that when ICT was primarily used in a community, it is therefore, called "virtual," but is otherwise known as "face-to-face" [6].

Virtual CoPs or VCoPswas developed as a new way of creating social interactions in order to support remote members in which new technology, e.g. internet and ICT, reduced the spatial and temporal distances, allowing community members to join and perform their practice anywhere anytime [5]. This was identified as strategic communities with the objective of creating competitive advantages and innovation, in which the members of these communities usually assume tasks at the highest level, or they are those, in the organization, considered to be experts in the domain [7].

In order to fulfil the objectives of this research, the researcher adopted the following key elements to develop the initial VCoPs framework: 1) legitimate peripherals – engaging newcomers and old-timers in the community; 2) domain – innovation as the common topic; 3) community – Human-Centered Design as a process that members engage and practice; 4) practice – Workplace by Facebook, as a virtual tool to share stories and resources.

2.3.3. Human-Centered Design (HCD)

To become a High Performance Organization, the financial and non-financial results must be significantly improved through a meaningful change in order to improve products, services, processes and/or business model, which comprise creating new values and exceeding customers' expectations. Organizations with the aim of becoming a High

Performance Organization, in particular, recognize innovation as an important factor as far as transformation of their business is concerned.

Creative thinking activities enhancing innovation, i.e. Human-Centered Design (HDC), have been receiving interest from many global organizations due to the fact that innovations can be created through interdisciplinary teams engaging in this approach. HCD facilitates rapid learning and understanding of the situation and people involved, create a knowledge sharing culture and collaboration, both internally and externally that help fostering innovations. They also demand an involvement and stakeholder all times in the process.

HCD can be defined as "a creative approach to problem solving that starts with people and ends with innovative solutions that are tailor made to suit their needs"[8]. The ISO standard 13407 describes HCD as "a multi-disciplinary activity, which incorporates human factors and ergonomics knowledge and techniques to enhance effectiveness and productivity, while improving human working conditions" [9]. There are four key activities in the process, which include: understanding and specifying the context of use, specifying the user and organization nalrequirements, produce design solutions, and evaluate designs against requirements.

The researcher adopted this approach and adjusted it into five key activities that aimed to leverage the innovation competency and innovation. The activities included: Empathy, Define, Ideate, Prototype and Test, which were expected to achieve the research objectives.

2.3.4. Innovation Competency

Managing individual performance and helping employees reach their highest potential to foster organizational competitiveness and improvement is vital for High Performance Organization (HPO). This can be done through effectively measuring, analysing and reviewing performance. HPO's values competencies that build organizational capabilities, while low-performing organizations focus on competencies that build individual capabilities [10].

Competency scales focus on the following; Leadership, Innovation, People Management, Communication and Delivery. They are scaled from level 1-6 (desired behavior = 1, undesirable behavior = 6). The innovation competency was defined as "People demonstrating this competency think, beyond immediate imperatives, to the future. It requires analytical and conceptual abilities, and the ability to formulate a practical plan with positive impact. This competency is not only focused on having visionary ideas or conceptual thinking, but also involves turning ideas into action" [11].

UNDP'sinnovation competency consists of six levels that measure the level of innovation. The six levels include: Level one - research for compliance and correctness; Level two - analyses and recommends; Level three - adapting ideas to a specific context; Level four - independently creating ideas; Level five -collaborates and integrates; and Level, six - transforms and inspire actions. Lastly, these six levels also include inappropriate behavior such as; does not think beyond the job at hand, does not appreciate relevance of strategic planning, sees no need for any improvement or change in the face of compelling evidence and actively resists change. From this framework, the expected behaviors, skills, and knowledge that enable job performance were described. The following research adopts this framework, with the participants being scored based on the Analytic Rubric scores.

2.3.5 Innovation

Many definitions of innovation have been developed over the previous years. Innovation can be defined as "the transformation of an invention into marketable products and services, the development of new business processes and methods of organization, and the absorption, adaptation and dissemination of novel technologies and know-how" [12]. Furthermore, innovation can be described as follows; "Innovation is the studied, practiced, and repeatable application of methods to bring something new into being in a way that's meaningful and useful" [13].Other studies have outlined innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" [14].

Previous research studied the relationship of corporate competencies toward the organizational performance managementfrom28 large global corporations in the financial services, high technology, industrial manufacturing, and retail industries. They were rated as "high performing" or "low performing", based on two dimensions of their financial performance profitability and revenue growth in 12-months compared to their competitors. The results showed that high-growth technology companies greatly reward creativity and innovation, and their keys to success are innovation, growth, and focus [10].

On the other hand, innovation can enhance non-financial performance. High technology and profitability are driven by both market-share leadership and process innovation [10]. They explained that high technology products can earn profits for only the first few years of their product's

life. Therefore, continuous improvement is required in order to extend their edge.

From the above statements, it can be concluded that High Performance Organizations greatly value innovation, and focus mainly on finding the right approach to increase their financial performance – potential breakthroughs and non-financial performance – continuous improvement.

2.3.6. High Performance Organization (HPO)

A High Performance Organization can be classified as an organization that achieves financial and non-financial results that are exceedingly better than those of its peer group over a period of five years or more, by focusing in a disciplined way on what really matters to the organization [15]. Overall, the framework consists of five HPO factors and 35 underlying characteristics, which specifically look into organization's management quality, openness, and action orientation, long-term orientation, continuous improvement and renewal, and workforce quality as well.

The study, which was looking into how suitable the framework is in a Thai context stated that Thai organizations need to focus on a few areas of improvement in order to become a HPO, namely, continuous improvement and renewal. The study highlighted that Thai organizations have difficulty with improving, simplifying, and aligning their processes. The relatively low scores for process improvement in many Thai organizations can be attributed to organizations' implementation of performance management, not as an organizational development intervention, i.e. for the purpose of continuous improvement, but rather as an annual performance appraisal tool [15].

Another key area for improvement within Thai organizations is individual competency. Organizations tend not to pay attention to the sub-process of strategy and translation to lower levels. Therefore, they are not planned for formal and informal communication channels. In addition, the current performance evaluation process in Thai organizations tends to create fear among employees and stifles teamwork [15]. HPO values competencies that build organization capabilities, rather than focus on competencies that build individual capabilities in a low performing organization [10].

In conclusion, the research conducted into High Performance Organizations shows that there is a direct and positive relationship between the five HPO factors and organizational performance. Similarly, work force quality had a positive correlation on the overall organizational performance. Employee involvement had a significant direct positive impact on the partnership management and supply performance of Thai organization [16]. Hence, it can be assumed from this research that if the output of this research (innovation competency and innovation) increases, then the organization is able to become an HPO.

2.4. Research Methodology and Tools

This study used a qualitative methodology with an online five-point Likert scale survey tool. The survey was completed by 13 Ph.D. and C-Level executive members in which each expert possessed at least 20 years of experience in their chosen fields, with these fields covering various areas of curriculum and instruction, instructional design, information and communication technologies for education, Knowledge Management from reputational universities, Chief Executive Officer, Chief Operation Officer, Human Resources Management, Organization Learning and Development, and Training from reputational local and international organizations.

3. Research Results

3.1. Proposed model

The model consists of 4 components:

1. Innovation Gap Analysis: The aim of this component is to determine the current state of the business towards the desire position through series of internal and external gap analysis, done by key stakeholders i.e. Executives (C-Level), Human Resources Director, President, Vice President, and other key personals who are involved in driving organization innovation strategy. There are four main steps: 1) Preparation: set up objective, set up domain, and set up selection criteria; 2) Organizational Analysis through Organizational Performance (HPO) Gap Analysis; 3) Environmental Analysis: Needs Analysis, and support intervention; and 4) Performance Analysis: initial Innovation Competency; and Innovation.

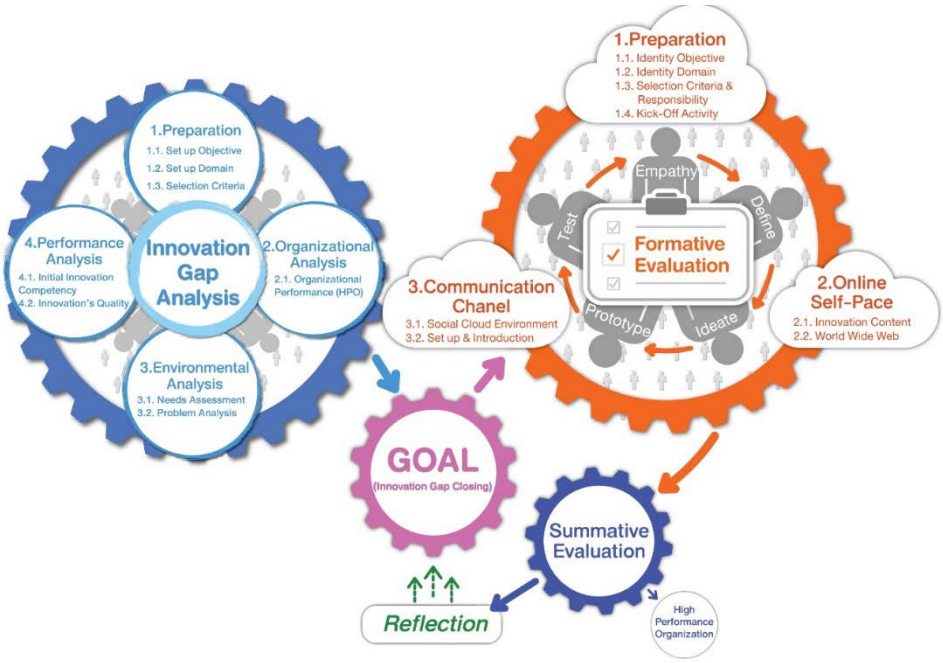

Figure 1: Virtual Community of Practice Using High Performance Technology Model To Enhance Innovation Competency and Innovation for High Performance Organization

2. Innovation Gap Closing Goal: After determining the current state of the organization's performance and innovation gap, the next phase is to identify "GOAL" to close the innovation gap. The essentials steps were to identify innovation definition, innovation objective, desired level of innovation competency; and desired level of innovations quality.
3. Virtual Community of Practice to Enhance Innovation Competency for High Performance Organization: The main goal of the third component of the model is to increase the level of innovation competency and innovation quality. There are three required essential steps in order to successfully develop the virtual community: 1) Preparation: identify objective; identify domain; identify selection criteria and responsibility of community members with the main focus on the facilitator, members, mentors and users; and followed by the "Kick-Off Activity" to introduce the community members, process, communications tools, timeline and other arrangements; 2) Online-Self Pace: innovation-related knowledge sharing resources available on the intranet; and the World-Wire-Web; 3) Communication Channel: the social-cloud environment for mobile devices, network and mobile application-Workplace; follow by "Set Up & Introduction" to set up user ID, and to connect all community members together; 4)Virtual Community of Practice to Enhance Innovation Competency for High Performance Organization: the boot camp activity that covered the following Design Thinking procedures: Empathy, Define, Ideate, Prototype and Test; and 5) Formative Evaluation. The result of these evaluations can be used to measure the effectiveness of each procedure, and to take an immediate action to adjust the model as necessary.
4. Summative Evaluation and Feedback: The last component of the model included: 1) Post-Test Evaluation of innovation competency; and 2) Post-Test Evaluation of innovations quality. The result of these evaluations can be used to measure the the end-result of the model against the desired Innovation Gap Closing Goal (Component 2).

3.2. Evaluation of the appropriateness of the model

According to the experts that evaluated the developed model through an online five-point Likert scale survey, findings from the evaluation revealed overall positive results. They suggested the opinion that the model was developed at the $\bar{x}$= 4.42 level of appropriateness. All experts had a positive reaction to the proposed conceptual framework, and they agreed on the applicability and the quality of the model.

Table 1. Evaluation Result

No.	Details	x̄	S.D.	Level of Appropriateness
Component 1: Innovation Gap Analysis				
1	Preparation of Community of Practice	4.54	0.53	Very strongly appropriate
2	Organizational Analysis	4.50	0.50	Very strongly appropriate
3	Environmental Analysis	4.33	0.62	strongly appropriate
4	Performance Analysis	4.50	0.57	Very strongly appropriate
Component 2: Innovation Gap Closing Goal				
1	Identify Innovation Definition	4.50	0.65	Very strongly appropriate
2	Identify Innovation Objective	4.42	0.64	Strongly appropriate
3	Identify Innovation Competency Objective	4.33	0.75	Strongly appropriate
4	Identify Innovation's Quality	4.42	0.76	Strongly appropriate
Component 3: Virtual Community of Practice to Enhance Innovation Competency and Innovation for High Performance Organization				
1	Preparation for Virtual Community of Practice Development	4.40	0.61	Strongly appropriate
2	Online Self-Pace	4.38	0.56	Strongly appropriate
3	Communication Channels	4.60	0.52	Very strongly appropriate
4	Virtual Community of Practice to Enhance Innovation Competency and Innovation for High Performance Organization	4.28	0.60	Strongly appropriate
5	Formative Evaluation	4.17	0.69	Strongly appropriate
Component 4: Summative Evaluation and Reflection				
1	Summative Evaluation	4.54	0.50	Very strongly appropriate
2	Reflection	4.38	0.75	Very strongly appropriate
Average		4.42	0.62	Strongly appropriate

The evaluation was divided into four components : the innovation gap analysis, innovation gap closing goal, virtual community of practice to enhance innovation competency and innovation for High Performance Organizations, summative evaluation and feedback.

The findings from the evaluation revealed that all experts agreed overall that the whole model was strongly appropriate ($\bar{x}$= 4.42, S.D. = 0.62), according to the criterion of the efficiency of the model described above.

The outcome from the first component, the innovation gap analysis, was positive. Within this component there were many researches. For example: organizational analysis, environmental analysis, and performance analysis. All these had the intention of determining where organization stands at this moment, and what can be improved.

In the first of four components: Innovation Gap Analysis, specifically, item 1, Preparing Community of Practice, received the highest mean score ($\bar{x}$= 4.54, S.D. = 0.53) follow by item 2, Organizational Analysis, and 4, Performance Analysis, receiving slightly lower mean score values ($\bar{x}$ = 4.50, S.D.= 0.50) and ($\bar{x}$= 4.50, S.D. = 0.57). Whereas the items3, Environmental Analysis, received the lowest mean ($\bar{x}$= 4.33, S.D. = 0.62).

While component 2: Innovation Gap Closing Goal, items 1, Identify Innovation Definition, received the highest mean score ($\bar{x}$= 4.50, S.D. = 0.65), which can be interpreted that the experts' opinions went to the same direction. Items 4, Identify Innovation's Quality, received mean score ($\bar{x}$= 4.42, S.D. = 0.76), whereas item 2, Identify Innovation Objective, received the same mean score with slightly lower S.D. score ($\bar{x}$= 4.42, S.D. = 0.64). Item 3, Identify Innovation Competency Objective, received a mean score ($\bar{x}$= 4.33, S.D. = 0.75).

Component 3: Virtual Community of Practice to Enhance Innovation Competency and Innovation for High Performance Organization, item 3, Communication Channel, received the highest mean score ($\bar{x}$ = 4.60, S.D. = 0.52). Followed by item 1, Preparation for Virtual Community of Practice Development, 2, Online Self-Pace,4, Virtual Community of Practice to Enhance Innovation Competency and Innovation for High Performance Organization, with slightly lower mean score values

($\bar{x}$= 4.40, S.D. = 0.61), ($\bar{x}$ = 4.38, S.D. = 0.56) and ($\bar{x}$= 4.28, S.D. = 0.60) respectively. The lowest mean score came from item 5, Formative Evaluation, ($\bar{x}$= 4.17, S.D. = 0.69). Lastly, component 4: Summative Evaluation and Reflection, item 1, Summative Evaluation, received the highest mean score value ($\bar{x}$= 4.54, S.D. = 0.50), followed by item 2, Reflection, ($\bar{x}$= 4.38, S.D. = 0.75)

The findings of the evaluation indicated that all experts agreed that 1) the model objectives are appropriate 2) concept, conceptual framework and learning theories of the model are appropriate 3) each component of the model meets objectives 4) each component step of the model appropriately used the right communications channels and technologies; 5) The model sufficiently capable of being effective in enhancing Innovation Competency and Innovation for High Performance Organization.

4. Recommendations

In order to take advantage of technology, virtual training has to be nurtured and embraced. The Workplace by Facebook application was primarily used as the communication tool in the community, whose members might find less effective when comparing to conventional face-to-face community. The main challenge facing VCoP is how to maintain momentum of members participating in the community. In response to this challenge, the researcher recommends the followings: 1) Finding the qualified facilitator who can continuously motivate the community member's participation. 2) Problem solving or raising issues might be able to drive members' engagement and change. 3) Mentors should use other media e.g. voice or VDO clip to communicate with community members.

5. Conclusion and Discussion

The findings from the evaluation indicate that the VCoPmodel is capable of being effective in enhancing innovation competency and innovation. The model is systematically developed by the following steps, in which the experts agreed that it was strongly appropriate and suitable ($\bar{x}$= 4.42, S.D. = 0.62). Overall, all four components were strongly applicable when looking at 1) Innovation Gap Analysis using the Human Performance Technology approach through Virtual Community of Practice. 2) Goal-Innovation Gap Closing to close the identified gaps. 3) Developed the Virtual Community of Practice to Enhance Innovation Competency and Innovation for High Performance Organization. 4) Developed the formative, summative evaluations, and reflection to measure the effectiveness of the process. The aimed goal of the development of this model is to enhance innovation competency and innovation, which will help transforming an organization to be the High Performance Organization, the expected research output.

In 2016, are search paper aimed at Characteristics and Indicators to Become High-Performance Organization (HPO) for Higher Education: KhonKaen University had synthesized thirty concepts of HPO of scholars, both from Thailand and overseas, in which the seven characteristics of HPO were found i.e. 1) develop human resources to become high performers; 2) effectively manage data and information; 3) process improvement; 4) customer-focus; 5) innovation-driven; 6) result oriented; 7) learning organization [17]. The research result on the appropriateness of Virtual Community of Practice using Human Performance Technology to Enhance Innovation Competency and Innovation for High Performance Organization model found that it has a great potential to enhance individual innovation competency and innovation, which align with the two characteristics of the HPO as stated in the above mentioned research. It is therefore assumed that through the successful implementation of the model, an organization will have a better chance and higher potential for becoming a High Performance Organization.

References

[1].International Society for Performance Improvement, ISPI. (1997). *What is Human Performance Technology?*.

[2]. Van Tiem, D., Moseley, J. L., & Dessinger, J. C. (2012). *Fundamentals of performance improvement: Optimizing results through people, process, and organizations*. John Wiley & Sons.

[3]. Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.

[4]. Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity*. Cambridge university press.

[5]. Agrifoglio, R. (2015). *Knowledge preservation through community of practice: Theoretical issues and empirical evidence*. Springer.

[6]. Dubé, L., Bourhis, A., Jacob, R., & Koohang, A. (2006). Towards a typology of virtual communities of practice. *Interdisciplinary Journal of Information, Knowledge & Management*, *1*, 69-70.

[7]. Correia, A. M., Mesquita, A. & Paulo, A. (2010). *Linking CoP with Value Chain Development in Smallholder Farming Systems*. 44.

[8]. Lanoue, Spencer. "IDEO's 6 step human-centered design process: how to make things people want." *UserTesting Blog* 9 (2015).

[9]. International Organization for Standardization, ISO-13407. (1999). ISO-13407, *Human-Centered Design Processes for Interactive Systems*.First edition 1999-06-01.ISO 13407:1999(E).

[10]. Bersin, J. (2007). The role of competencies in driving financial performance. *Bersin and Associates Research Report*.

[11]. United Nations Development programmer, UNDP. (2016). *United Nations Development Programme.Core Competency Framework.*

[12]. Curtis, J. M. (2016). Trade and Innovation: Policy Options for a New Innovation Landscape. E15 Expert Group on Trade and Innovation – Policy Options Paper.*E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum*.8.

[13]. Moris, L., et al. (2004). High Performance Organizations in a Wicked Problem World. *2004 The International Conference on Systems Thinking in Management.* Innovation Labs LLC 10.

[14]. OECD/European Communities. (2005*).* The Measurement of Scientific and Technological Activities. *Oslo Manual Guidelines for Collecting and Interpreting Innovation Data*, 3rd Edition.

[15]. A. de Waal, A., & Tan Akaraborworn, C. (2013). Is the high performance organization framework suitable for Thai organizations?. *Measuring Business Excellence*, *17*(4), 76-87.

[16]. Vanichchinchai, A. (2012). The relationship between employee involvement, partnership management and supply performance: Findings from a developing country. *International Journal of Productivity and Performance Management*, *61*(2), 157-172.

[17]. Kittiwimonchai, P. & Sirisuksilp, S. (2016). Characteristics and Indicators to Become High-Performing Organization (HPO) for Higher Education Case Study: KhonKaen University. *Suranaree. Suranaree J. Soc. Sci. 10*(1), 83-104.