A Community of Innovation: Technological Driven System Based on Participatory Rural Appraisal and Design Thinking Approach

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Abstract

Community of innovation is the localized-driven system of community to create local innovation, which interweave inside noble wisdom with outside explicit knowledge. The aim of this research is to develop the technological system for driving communities of innovations based on the design thinking approach and participatory rural appraisal. The research applied qualitative methods by using content analysis and field studies. The research found that the four key principles of the system concept were (1) Collaboration: sharing, meaning, and diversity (2) Methods: insight, creation and action (3) Mindset: empathy, critical and compassion and (4) Inherent: moral, mental and wisdom. The system consisted of system goal, technological-driven toolkits, system environment, process, and system users comprising local wisdom, external experts, community leader and community developer. The system also composed of three subsystems, namely, Team Building System, Innovation Creating System and Evaluation System. The subsystems can be interpreted in three phases: (1) The creation of faith; creating of confidence in intellect, virtues and perseverance to access the truth (2) The creation of intellect; building body of knowledge with rationalism problem-solving process based on the natural truths and

interrelating factors and (3) The investigation; evaluating development of innovation and self progress with a neutral view.

***Key Words*:** Community of Innovation; Design Thinking; Participatory Rural Appraisal; Local Innovation

Introduction

It is apparent that Thai society is adjusting itself following the changing context of economy, social, politics and others by creating economic opportunities based on knowledge, technology and innovation driven by wisdom. Nonetheless, wisdom that would bring about sustainable development has to be 'noble wisdom' crafted by accumulated experience based on absolute understanding of nature and knowing of what going on as is. The noble wisdom is the ways to definitely solve any problem for individuals and the society. (Phra Brahmagunabhorn (P. A. Payutto), 2012; Amornvivat, 2011; Puntasen et al., 2006)

Local innovation is one developed from the capital of creativity along with cultural richness and quality of life development. Innovative production process is a local innovation that carries on local wisdom derived from the noble wisdom. Its definition has been adjusted with local wisdom harmoniously and balance with the modern society. Its aim is to enable community's participation in any development via the explicit knowledge on external changes and harmonization of such understanding into the existing local wisdom under the social learning process. The effort is seen as change management through localization by community dwellers via their participation, creation and execution with full awareness to render positives changes within their own communities.

Community of innovation is the concept to render innovation under the interdisciplinary system through group activities with high flexibility to weave together knowledge and skills. Design thinking is a thinking process to create innovation with a cluster of systematic thinking and myriad of executions under the creative atmosphere of the design science. Participatory Rural Appraisal is a process to open a new horizon of community dweller development with fast, facilitating and easy to understand methods. It can stimulate community to exchange their knowledge in broad and deep aspect.

This research aims to create a system to drive the community with knowledge of the noble wisdom to create local innovation under the concept of community of innovation, design thinking and participatory rural appraisal. It also aims to promote learning process for change to break

the culture of individualism to the state of networking which is the learning path to harmonize with changes in society, technology and the environment of the modern world.

Related Literature

Community of Innovation

The community of innovation has been conceived by the conglomeration of three concepts namely social learning approach, creativity approach and social and economic approach. Ubiquitous communication in the present world society has stimulated collaboration and community based development of new idea, technologies and practices. Wherein the creativity can occur from interaction with both physical and digital worlds, under the world of interaction on high frequency technology networks at real time enabling swift cultural changes and the social and economic trends is based on innovation. (West, 2009; Proctor, 2005)

Many scholars have developed the concept of the community of innovation and used various names to describe these communities, including communities of creation (Sawhney and Prandelli, 2000); innovative knowledge communities (Hakkarainen et al., 2004); creative organizations (Banahan and Playfoot, 2004); networked strategic communities of business (Kodama, 2005); knowledge creating communities (Bielaczyc and Collins, 2006); wisdom networks (Benton and Giovagnoli ,2006) and communities of innovation (Coakes and Smith, 2007; West, 2009). Meaning as a whole, the community of innovation is a supporting concept for team innovation development by the community, formed by members of differing skills who work together under the group process with high flexibility and efficiency to render innovation.

The community of innovation focuses on mind opening and exchange of new ideas from outside. Such organization, nonetheless, does not necessary to begin with initial research and crystallize their idea until innovation is derived, solely by themselves. Instead it needs only courage thought to realize, analyze, evaluate and gather external knowledge and experience that may differ from those what the organization could have and integrate those

knowledges together to create valuable innovation. The process is to create innovation in a new perspective with wider and more complex, moreover, lesser time consuming.

Components and characteristics of the community of innovation consists of: **(1) Team Members**, who have open-mindedness, humbleness, determination, faith and have sense of ownership as well as cherish in value of their own community; **(2) Team,** that have diverse skills members, appropriate team size and a team leader as a center of faith who could weave together understandings with clear objective and understanding mutual goal; **(3) Working Atmosphere,** with high flexible team activity, role rotation, expertise exchange, friendliness, encourage freedom of thought, questioning and discussion, deliberative thinking and listening, provision the channel for feedback and verification, and combination of management methods to achieve conclusion from myriad of thoughts; and **(4) Result,** Innovation development.

Design Thinking

"Innovation is a more complex concept than many realize. Far more than principles, rules and procedures, it is a process most effective when imbued with attitudes and ways of thinking that have evolved over generations within the community of those who routinely practice creative invention and synthesis. Significant among these are ways of thinking from the design fields appropriately referred to as *design thinking*" (Oven, 2006) Design Thinking is a process to derive at innovation integrating human-center design concept by utilizing a set of methods with unique characteristics to seek, analyze and integrate all data available. The aim is to pursue knowledge and understanding of fact as per natural setting of lifestyle and environment of informants. The derived information is then be interpreted with a wider and deeper perspective via application of various methods from qualitative research, humanity and designing principles to yield innovation based on human need with academic, technological and business viabilities. (Kumar, 2009; Kelley and Littman, 2000; Young, 2010)

In contrast to critical thinking which is a process of analysis and breaking things down, Design thinking involves building things up.

(Kelly, 2010) The design thinking process is best described metaphorically as a system of spaces rather than predefined series of orderly steps. The spaces demarcate different sorts of related activities that together form the continuum of innovation. (Brown, 2008; Brown and Wyatt, 2010) Like any process, design thinking will be practiced at varying levels by people with different talents and capabilities. Designer can mix and match methods and techniques to suit the specific needs of the design challenge at hand. (Sato, 2009; Liedtka and Ogilvie, 2011)

The principles of design thinking are as follows; (1) Human-centered design (2) Broader contextual view (3) Research-based approach (4) Collaborative and multi-disciplinary team (5) Iterative delivery and prototyping and (6) Essential innovating trait comprising empathy, optimism, experimentalism, integrative thinking and collaboration. (Brown, 2008; Young, 2010; Meinel and Leifer, 2011)

Participatory Rural Appraisal

Participatory Rural Appraisal (PRA) is the methodology for community development under an alternative paradigm to holistically view the world and society, focused on searching to understand behaviors and structures that pose as source of problems through cultural relationship and context. It also believes in value and pride of human with hidden potential and power to change and develop quality of life until achieving self-reliance. The role of a community developer is to change working paradigm to that of inside out methodology; to encourage freedom among community members empowering them to determine their way of life. The community developer ought to create trust, nurture balanced relation while adjust the role of giver and controller to that of facilitator, counselor and kindler who lays down conditions enabling the community to be inspired, responsible and capable to benefit the public at large. (Mascarenhas et al., 1991; Chambers, 1992; Samutkup and Kiti-Arsa, 2004)

PRA has three main components which are (1) facilitators' behaviors, attitudes and mindsets linked with precepts for action (2) methods which combine visuals, tangibles and groups and (3) sharing without boundaries. The interplay of these resonates with theories of chaos, complexity,

emergence and deep simplicity, especially self-organizing systems on the edge of chaos. (Chambers, 2007) The following key themes are proposed as constituting PRA in practice (1) Substantial use of indigenous knowledge (2) Interdisciplinary approach and teamwork (3) Rapid and progressive learning (4) Sharing of information and ideas (5) Self-critical awareness and responsibility (6) Facilitating-they do it (7) Triangulation (8) Exploratory and highly interactive research and (9) Flexibility and use of conscious judgment.

In conclusion, PRA is a way to help people to participate together in learning, and then to act on that learning. Paradigmatically, this is the part of shift from things to people, from top-down to bottom-up, from standard to diverse and from control to empowerment. (Chambers, 2007)

Local Innovation

The meaning of local innovation was considering under the concept of wisdom and Buddhist economy.

Wisdom is the crystallized body of knowledge through accumulation of human intellect resulted from systematic thinking under an intimate and sophisticated interaction between human, society, nature and culture. The derived wisdom is to solve problems and respond to human need to adjust and live in harmony with both physical and sociological surroundings. With this regard, the wisdom represents holism correlating with other systems within the society; contains diversity and constantly changes. (Na Thalang, 1997; Phongphit, 1993; Sirasoonthorn, 2009) Factors effecting the development of the Thai wisdom consist of integration of existing and new knowledge; accumulation and inheritance of such knowledge; comparison of existing and new experiences; existence of unsolvable problems; and Buddhist foundations. (Office of the National Education Commission, 1998) As culture, the context of origin of wisdom could be described hierarchically as follows (1) Fundamental Level: Truth that exists naturally (2) Intermediate Level: Ethics or principles of virtues which is the truth that human should follow in harmony with nature; and (3)Advanced Level: Culture which is norms or practices yielding result as per human's desire. It could be seen that truth and ethics are of permanent nature while culture is a substance of

external forms with constant changes. Culture is the formation and principles requiring adjustment to suit the surrounding time and space. In that respect, the value of culture can be measured by the wisdom to appreciate the truth underlining such culture. (Phra Dhammapitaka (P.A.Payutto), 1996)

Additionally, the process to produce and interpret value of wisdom also coheres with Buddhist economy which stipulates that production under the Buddhist economy is not driven by greed but intellect over capital, hence the term cognitivism. Consumption under the Buddhist economy is moderate as per required to sustain quality of life and as supporting basis for self development to achieve the goal of 'good and happy life' which could be measured by means of benefits at three respective levels i.e. benefit to self, to others and to the society. (Phra Brahmagunabhorn (P.A.Payutto), 2011; Puntasen et al., 2006; Chiangkul, 2008)

Therefore, the local innovation in this research represents new methods or products based on development of existing local wisdom that has been interwoven with new concepts to utilize the value of conventional wisdom in order to create new values for the development of good and happy way of life beneficial to self and the society as a whole.

Research Methodology

The system development was based on qualitative methods. The design analysis phase uses content analysis, interview, observation and field studies in 3 selected communities in Samutsongkram province to collect data for analyze the following aspect: attribute, behavior, activities, means and ends, flows, function, process, trend and perception. The design synthesis phase uses various design methods tools for forming, developing and managing ideas. Expert focus group was employed to validate the system.

Result

The analysis phase (1-2) was to find a body of knowledge in line with the changing world and to determine specific attribute that focus on user's needs regarding process and deliverable. The synthesis phase (3) was to generate system concept and to develop the system.

1. Trend Analysis

The researcher has studied global tendencies and possibilities in order to derive definition and value with a focus to develop the system with clarity and correctness. The effort was based on the studies of various situations, changing conditions of economic and social aspect, mode of production, creativity and innovation trend, development paradigm, qualitative research methodology and social learning theories dimensions. It was found that there are four trend patterns that are consistent in all dimensions namely (1) giving precedence to human intellect (2) holistic connectivity with interrelations (3) learning by practicing and (4) place importance on socio-cultural contexts and systems. (Puntasen, 2004; Nagavajara, 2009; West, 2009; Amornvivat, 2011; Walliphodom, 2011; Wasi, 2012; Sirasoontorn, 2013; NESDB, 2012)

2. User Analysis

The insight related to the learning culture of local wisdom, the core system user, including internal and external factors as follows:

Internal factors considered as foundation of local wisdom were mental and physical perseverance. The mental perseverance begins from having faith in individual, rules or other matters with supporting rationales. Such faith leads to believe in self esteem which is a driving force for determination and knowledge acquisition. Physical perseverance then leads to intellectual curiosity that was derived in various way either by self learning, discussion with knower, socialize with true friends, inheritance from ancestors, study from gurus, trial and error, observation, even by absorbing from the society and nature, all with righteous consent and brave and continuous perseverance. It was also found that amidst the myriad of learning methods, the heart of the matter are hand-on experience, self valuation and periodical improvement until such knowledge has been tested and proven by countless practices in accordance with natural and social surroundings. Furthermore, it was also found that majority of local wisdom following religious teachings in their way of life ranging from daily living with moral, mental training to understanding the truth of other natures by their wisdom. Religion and belief encourages them to make use of human intellect power.

Considering factors relating to external world, local wisdom shows experience and pattern of relationship with the following five external factors **(1) Cognitive;** understanding the meaning of life as a whole, showing virtue and intellectual bravery, critical reflection, reverence for earnestness, optimistic **(2) Social;** living interdependently with others, join the activities that benefit the community, self-reliance **(3) Culture;** being trusted and respected by others, proud of own origin yet agreeable to harmonization of difference culture, learning through cultural traditions, rituals inherit ideology **(4) Faith;** adhering to life principles, religious teachings , the King's initiatives "Philosophy of Sufficiency Economy", being compassionate to others **(5) Physical;** having time and space for dialogue and sharing knowledge, having a place to seek solitude or trying to maintain a sense of care freeness, comfort and contentment.

3. System Development

The system metaphor could be said as a journey of team members sharing the same route and goal with correct and clear guiding map. Each member may embark on various vehicles to overcome obstacles in their respective routes while supporting each other to ensure timely arrival at the shared goal. Each member, at the same time, gains experience unique to their respective journey.

The system association is the value of intellectual procedure to seek knowledge at two levels namely knowledge of natural truth and knowledge to yield benefits for life and society from such truth, which is the key feature of local innovation.

The system attributes are focused on **(1) collaboration** to develop interdependent intellect comprising sharing, meaning, and diversity **(2) mindset**, which is the attitude toward the process comprising empathy, critical and compassion and **(3) methods**, which provide opportunities to dislodge hidden assumptions and uncover the influence of biases and heuristics comprising insight, creation and action process.

Activities in the system consist of **(1) technology-driven toolkits**, that has been developed to expand thinking capacity of a user with easy to understand and substantially clear graphic, effective for group execution,

enable participation so that the members could execute, think and evaluate, and flexible enough for use within the community **(2) activity vibe** encompasses interdependent, deliberation, consideration, understanding and acceptance towards each other as well as practice. The activities have to be flexible, lively, and friendly while base on trust and admiration in accordance with lifestyle and social attributes.

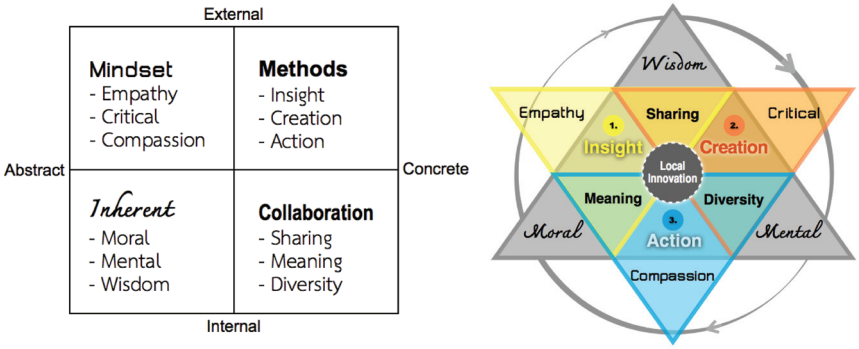

Figure 1 The Four Key Principles of the System

Considering primary and secondary data based on inductive and holistic approach, the most compelling concept systems consist of four key principles namely: mindset, methods, collaboration, and inherent. The left framework represents the relationship between user attribute and system characteristics. The right framework shows its relationships through the local innovation development process.

System elements, considering their relationship, consists of two main elements namely **(1) system users** which are local wisdom experts, external experts, community leader and community developer and **(2) system itself** includes system goal, technological-driven toolkits, process and system environment. Whereas the community developer is a main facilitator between the system and its users. It was found that the system elements are thoroughly interrelated both by direct and complex conditions. Therefore, the system design has to be carefully considered each element in detail of natures particularly that of the system users. In that respect, physical structure of the system has to be developed in such a way to accommodate the building up of 'energy' for the users to drive the system forward.

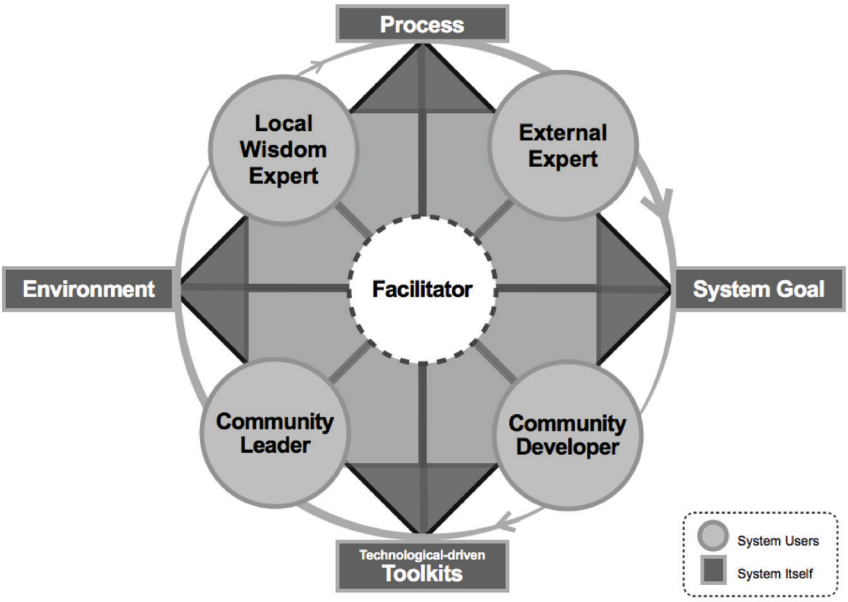

Figure 2 The Relationship of The System and The System User

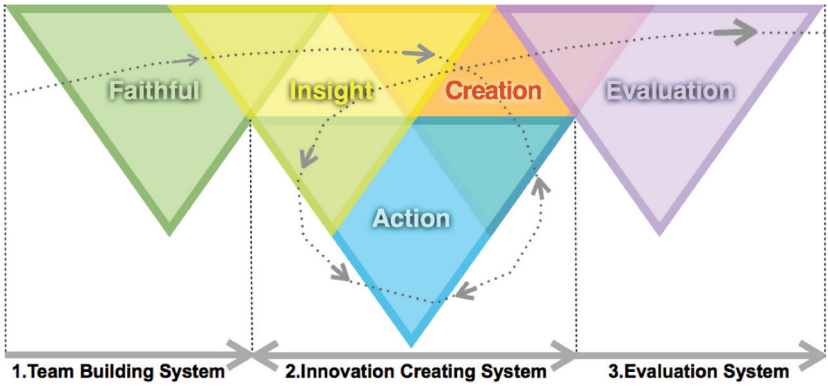

Figure 3 The Overview of The System Component

The system consists of three following subsystems:

1. Team building system: including 3 phases: (1) training of community developer team; (2) identifying target community; and (3) seeking innovation creating teams within and outside the target community.

2. Innovation creating system: including 8 steps: (1) open one's mind; (2) create innovative climate; (3) identify core direction; (4) analyze value and context; (5) integrate set of intellect; (6) deliberate concept; (7) prototype and test; and (8) execution plan.

3. Evaluation system: including 2 phases: (1) evaluating local innovation; and (2) evaluating community of local innovation.

The system output consists of local innovation and community of local innovation, could be measured with the evaluation toolkit by system user.

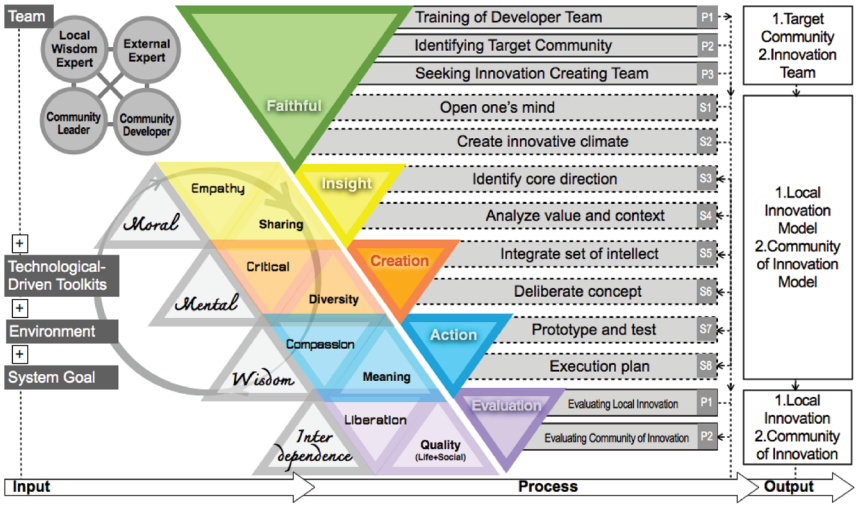

Figure 4 The Unified Process of Technological System for Driving Communities of Innovations Based on the Design Thinking Approach and Participatory Rural Appraisal

Discussion

Regarding to the outputs of the research, the system development can be discerned by religious principle, which is the foundation of the local wisdom as follow: (1) Local innovation development process is based on truth-seeking of self, life and the environment via problem solving by way of rationale derived by one's intellect. The process was in accordance with the Noble Truths principle governing human way of life which is universal and could be applied in all executions and life development. (Kraisarawut, 2012); and (2) Community of local innovation is both means and ends. It is a learning system that heightens human value through intellectual interdependency via community process and relativity in accordance with existence and relationship of human, society and natural based on goodwill and assistance. The development process was in accordance with the religious rules of practice that wisdom should be render with compassion. (Phra Brahmagunabhorn (P. A.Payutto), 2012) Thus the technological system for driving communities of innovations based on the design thinking approach and participatory rural appraisal is one system to create comprehensive knowledge that correct, penetrate and manageable, via a life journey led by intellect, started by the smallest unit in the society.

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Reference

Amornvivat, S. (2011) *Teacher Education and Challenging Transformation.* Bangkok: Faculty of Education, Chulalongkorn University.

Attig, B. Y. and Tangcholthip, K. (2009) *Analysis of Qualitative Data: Data Management, Interpretation and Meaning*. Bangkok: Institute of Population and Social Research, Mahidol University.

Brown, T. (2008) Design Thinking. *Harvard Business Review*, June: 84-92.

Brown, T. and Wyatt, J. (2010) Design Thinking for Social Innovation. *Stanford Social Innovation Review*, Winter: 31-35.

Buddhadasa Indapanno Archives. (2012) *Belong-Liberation-Compassion.* Bangkok: Buddhism printing of Thammasapa.

Chambers, R. (2007) From PRA to PLA and Pluralism: practice and theory. Brighton, UK: *Communication Unit, Institute of Development Studies at the University of Sussex*.

Chambers, R. (2007) Poverty research: methodologies, mindsets and multidimensionality. Brighton, UK: *Institute of Development Studies at the University of Sussex*.

Chiangkul, W. (2008) *Solving the Economic Crisis by Buddhism*. Bangkok: Saitharn Publishing.

Coakes, E. and Smith, P. (2007) Developing communities of innovation by identifying innovation champions. *The Learning Organization*, 14(1): 74-85.

Engestrom, Y. (2008) *From Teams to Knots: Activity-Theoretical Studies of Collaboration and Learning at Work.* New York: Cambridge University Press.

Fuller J. et al. (2006) Community based innovation: How to integrate members of virtual communities into new product development. *Electron Commerce Res*: 57-73.

Hakkarainen, K. et al. (2006) Design Principles and Practices for the Knowledge-Practices Laboratory (KP-Lab) Project. *EC-TEL 2006, LNCS 4227*: 603-608

Hall, E. T. (1990) *The Silent Language*. New York: Anchor books.

Hildreth, P. and Kimble, C. (2004) *Knowledge Networks: Innovation Through Communities of Practice.* United Kingdom: Idea Book Publishing.

Kelley, T. and Littman, J. (2000) *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm.* New York: Doubleday.

Ko-anantakul, P. C. (2002) *Insider: Field Experience of Thai Anthropologists.* Bangkok: Princess Maha Chakri Sirindhorn Anthropology Centre.

Kraisarawut, S. (2012) *Noble Truths for Everyone.* Bangkok: Chulalongkorn University Dharma Center.

Kumar, V. (2009) A Process for Practicing Design Innovation. *Journal of Business Strategy*, 30(2/3): 91-100

Liedtka, J. and Ogilvie,T. (2011) *Design for Growth: A Design Thinking Tool Kit for Managers.* New York: Columbia University Press.

Mascarenhas et al. (1991) *Participatory Rural Appraisal: Proceeding of The February 1991 Bangalore PRA Trainers Workshop.* London: IIED.

Meinel, C and Leifer, L. (2011) Design *Thinking: Understand-Improve-Apply.* Springer Science+ Business Media.

Nagavajara, J. (2009) *The Existence of Thai Humanities.* Bangkok: Amarin Printing and Publishing.

Na-songkhla, J. (2007) *E-instructional Design*. Bangkok: Center of Textbooks and Academic Documents, Faculty of Education, Chulalongkorn University.

Na-Thalang, E. (1997*) Four Regional Local Wisdom: Lifestyle and Learning Process of Thai Villagers.* Nonthaburi: Sukhothai Thammathirat Open University.

National Economic and Social Development Board (NESDB) (2012). *Summary The Eleventh National Economic and Social Development Plan.* Bangkok: Sahamitr Printing and Publishing.

Nussbaum, B. (2004) The power of design. *Business Week*. [Online URL: http://zum.io/wp-content/uploads/2010/06/Design-thinking-and-sustainability.pdf] accessed on June 12, 2010.

Oven, C. L. (2006) *Design Thinking: Driving Innovation.* The business Process Management Institute.

Phongphit, S. (1993) *Local Wisdom and Rural Development.* Bangkok: Amarin Printing Group and Publishing.

Phra Brahmagunabhorn (Payutto, P. A.) (2012) *Buddhadhamma.* Bangkok: Pli-Dhamma Printing.

Phra Brahmagunabhorn (Payutto, P. A.) (2011) *Buddhist Economics.* Bangkok: Num-Aksorn Printing.

Phra Dhammapitaka (Payutto, P. A.) (1996) *Thai Culture Inheritance based on Educational Approach.* Bangkok: Buddhadhamma Foundation.

Puntasen, A. (2004) *Buddhist Economics: Evolution, Theories and Its Application to Various Economic Subjects.* Bangkok: Amarin.

Puntasen et al. (2006) *Buddhist Economics: Student and Public Issue.* Bangkok: Dokya-Academic Printing.

Samutkup, S.and Kiti-Arsa, P. (2004) From Rapid Rural Appraisal to Participatory Rural Appraisal. In *Concepts and Methods in The Study of Rural Society.* (Thongyoo, M.) Khon Kaen: Faculty of Humanity and Social Science, Khon Kaen University.

Sato, S. (2009) Beyond Good: Great Innovations Through Design. *Journal of Business Strategy*, 30(2/3): 40-49

Sawyer, K. (2007) *Group Genius: The Creative of Power.* New York: Basic Books.

Scardamalia, M. and Bereiter, C. (2006) Knowledge building: Theory, pedagogy, and technology. InK. Sawyer (Ed.). *Cambridge Handbook of the Learning Sciences*, 97-118. New York: Cambridge University Press.

Sirasoonthorn, P. (2011) *Community of Practice: Concept, Technique and Process.* Bangkok: Chulalongkorn University Press.

Sirasoonthorn, P. (2013) *Concept, Theory and Technique for Social Development Practice.* Bangkok: Chulalongkorn University Press.

Vygotsky, L S. (1978) *Mind in Society: The Development of Higher Psychological Processes.* Cambridge: Harvard University Press.

Walaisathien, P. (2005) *Learning and Knowledge Management Communities.* Bangkok: The Thailand Research Fund.

Walliphodom, S. (2011) *Evolution of Thai Socio-Cultural.* Bangkok: Muang Boran Press.

Walliphodom, S. and Na thalang, E. (2001) *Socio-Cultural Development in Thai History.* Bangkok: Amarin.

West, R. E. (2009) What is shared? A framework for understanding shared. *Education Technology Research and Development*, 57: 315-332.

Young, G. (2010) Design Thinking and Sustainability. [Online URL: http://zum.io/wp-content/ uploads/2010/06/Design-thinking-and-sustainability.pdf] accessed on May 3, 2012.