Integrating Individual Learning Processes and Organizational Knowledge Formation: Foundational Determinants for Organizational Performance

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This research examined the link between learning processes and knowledge formation through an integrated literature review from both academic and practical viewpoints. Individuals' learning processes and organizational knowledge creation were reviewed by means of theoretical and integrative analysis based on a lack of empirical research on the association between these two key factors and performance improvement. The results propose a conceptual map for effective organizational performance improvement through the individual learning and organizational knowledge formation.

Keywords: Learning Process, Knowledge Formation, Learning Organization

The primary rationale of implications of training and learning activities in organizations is improving organizational performance based on the transferring of individuals' learned knowledge to the workplace (Rothwell & Sredl, 2000). Additionally, the goal of the transfer is the full application of newly learned knowledge and adapted skills to improve individual and organizational performance (Broad, 2003). In this regard, organizational performance improvement is strongly associated with individuals' learning process and transfer of learned knowledge to the workplace in a perspective of performance-oriented Human Resource Development (HRD). Currently, integrated individuals' knowledge is regarded as the most critical asset beyond any other resources (DeLong, 2004; Gupta & Sharma, 2004; Senge, 1990). In order to take the competitive advantage, continuous organizational performance improvement through the systematic organizational knowledge creation based on the organizational learning system and integrated individuals' knowledge articulation process has been more focused (Nonaka & Takeuchi, 1995; Senge, Scharmer, Jaworski & Flowers, 2005).

Purpose of the Research and Significance

This research is primarily aimed at providing the conceptually integrated process of organizational knowledge formation through the linkage between the individual learning and organizational knowledge creation. This research has critical significance for both academic and practical practitioners. Perhaps it is true that literature review-based research is weak in providing the "how" perspective. However, this interdisciplinary research, dealing with three perspectives -- *learning*, *knowledge and performance improvement* -- in two critical facets, *individual and organization*, could shed light on the mutually complementary conceptual framework for implication of various performance improvement (PI) practices, which include general training, organization development, knowledge management, organizational learning interventions, and so forth.

Research Questions and Conceptual Framework

To date, several studies have been conducted on the individual learning and knowledge creation (i.e., Argyris & Schön, 1978; Nonaka & Takeuchi, 1995; Senge, 1990). According to the literature, individuals learning process would be the foundation for the organizational learning and knowledge creation. Furthermore, several environmental factors, such as management support, the organization's mission, and supportive learning, would be linked to organizational learning practices (Watkins & Marsick, 1996; von Krogh, 1998; von Krogh, Ichijo & Nonaka, 2000).

Finally, created knowledge could be embedded into organizational mental model for the knowledge re-creation and knowledge transfer practices (Senge, 1990; Nonaka & Takeuchi, 1995).

In order to identify the mutually exclusive integrated concept with individual learning processes and organizational knowledge creation, the following research questions are examined:

1. What are the critical factors for promoting individuals' learning at each mode of the learning process?
2. What are the required sequential factors to promote continuous organizational knowledge creation?

Using the literature review and applying an integrated holistic approach, a research framework (see Figure 1) was developed to guide this study.

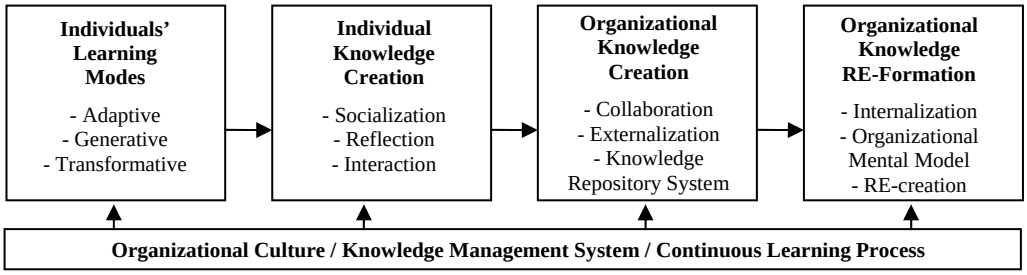

Figure 1. The integrated process of organizational knowledge formation through the organizational learning system based on the individuals' learning modes and knowledge creation

Method

This is conceptualization research based on the relevant literature review regarding core themes of organizational knowledge formation. The Pennsylvania State University Access System (LIAS), which contains 350 interlinked scholarly and practical databases, was used to search comprehensive literature for developing reliable research. Research was conducted on multiple LIAS databases, including Business ABI/Inform Global, ProQuest Direct of newspaper, magazines, and business, and the Wiley Inter-science Journal.

As aforementioned, the literature review yielded several conceptually integrative perspectives, which include individual learning, knowledge creation, and knowledge re-formation. In order to construct a genuinely integrated alliance among the various perspectives, six subsequent core themes were scrutinized: (a) individuals' learning mode; (b) organizational knowledge creation; (c) systematic knowledge management practices; (d) effective organizational learning process; and (e) supportive environmental factors and performance improvement. In order to synchronize the procedures of each relevant perspective, the theory of organizational knowledge creation has been more intensively explored.

Individual Learning Processes and Organizational Knowledge Formation

Individual Learning Modes

With regard to individual learning, individuals' learning in organizations has been influenced by given policy, organizational culture, learning system, and interpersonal relationships (Sessa & London, 2006). Three modes of individuals learning were discussed.

Adaptive learning mode. According to Argyris and Schon's (1978) single-loop learning, individuals' learning process could be initiated by the reflective and adaptive learning manner. Through this learning process, individuals' pre-existing tacit knowledge could be deep-rooted as the more truly believed knowledge into individuals' mental model (Nonaka & Takeuchi, 1995). In this learning process, individuals have active interactions with organizational environment; and organizations need to provide the opportunities and positive environmental support for the promotion of the continuous individuals' adaptive learning (Nonaka & Takeuchi, 1995; Sessa & London, 2006).

Generative learning mode. The generative learning process could create new skills, knowledge and applicable methods (Sessa & London, 2006). This generative learning process could be more effective through an alliance with social interaction in organizations; and through this socialized learning practices (Bandura, 1986), individuals' tacit knowledge could be shared and embedded into organizational knowledge repository (Nonaka & Takeuchi, 1995; Sessa & London, 2006). Accumulated individuals' knowledge could be converted into the organizational explicit

knowledge -- called *externalization* -- through the process of circulative social interactions (Nonaka & Takeuchi, 1995). This generative individual learning could result in the groundwork for continuous organizational change, and which is the core theme of organizational knowledge-based performance improvement (Ramanujam, 2003; Sessa & London, 2006).

Transformative learning mode. The ultimate goal of the learning interventions in organizations could be considered as the transfer of the learned knowledge to the workplace. In this perspective, individuals' transformative learning process could be regarded as the more practical learning practices for organizational knowledge applications. In order to promote this practice-oriented learning process, continuous interpersonal conversation and supportive culture are more critical aspects in terms of organizational knowledge application (Nonaka & Takeuchi, 1995; Nonaka, Peltokorpi, Tomae, 2005; Sessa & London, 2006).

Theory of Organizational Knowledge Creation

In the current economic environment, the importance of knowledge and knowledge creation has been focused more than any other resources for firm's sustainable competitive advantage (Nonaka & Takeuchi, 1995; Nonaka, Takeuchi & Umemoto, 1996). The concept of knowledge creation, which could be initiated by individuals' knowledge creation process for the organizational knowledge creation, was discussed.

Organizational knowledge conversion theory. Knowledge is defined as "a set of justified true beliefs" (Nonaka & Takeuchi, 1995, p.3); and *organizational knowledge creation* is defined as "the capability of a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems" (p.58). Many scholars and practitioners have researched on the foundation of the organizational knowledge creation process, and among them four-step model of knowledge conversion and a five-phase model of the organizational knowledge creation process, developed by Nonaka and Takeuchi (1995), were reviewed.

The basic concept of knowledge conversion is based on how two types of knowledge (tacit and explicit knowledge) interact to create new organizational knowledge; and this knowledge conversion process would be related to individuals' knowledge-based interactions. On the first hand, Nonaka and Takeuchi (1995) conceptualized the concept of knowledge conversion -- that knowledge is created through social interaction between tacit and explicit knowledge of individuals. The following are the general assumptions of knowledge conversion: (1) tacit to tacit (socialization), (2) tacit to explicit (externalization), (3) explicit to explicit (combination), and (4) explicit to tacit (internalization). On the other hand, Nonaka and Takeuchi (1995) developed a five-phase model of knowledge creation process based on the proposed four different ways of knowledge conversion: (1) sharing tacit knowledge, (2) creating concepts, (3) justifying concepts, (4) building an archetype, and (5) cross-leveling knowledge; those five-phase model could be more related to knowledge creation process at the organizational level.

Organizational knowledge creation based on the individuals' learning is a synthesized dialectical process, in which various feats are integrated and amalgamated through dynamic interrelationship among individuals, groups, and environment. (Nonaka, Takeuchi & Umemoto, 1996; Nonaka, Toyama & Nagata, 2000; Nonaka & Toyama, 2003). They suggest that organizational knowledge is created through dialectic thinking and acting based on the individuals' continuous communication that could be generated by tacit knowledge rather than by the theorized knowledge in the organization (Nonaka & Toyama, 2003).

In accordance with organizational knowledge theory (Nonaka & Toyama, 2003), each entity (individuals, groups, and organizations) coexists with a related environment. As a consequence, positive organizational environmental factors (i.e. organizational culture and management system) promote knowledge creation for both levels of the individual and organization. (Nonaka, Toyama & Nagata, 2000; Nonaka & Toyama, 2003).

Knowledge Creation and Management

One of key trends of the performance improvement (PI) fields is the increasing focus on the knowledge retention and continuous knowledge creation through the knowledge management system and learning organization mechanism. The concepts of learning organization and knowledge management system are discussed.

Learning organization. The notion of the learning organization has received considerable attention in the scholarly literature because advanced learning processes have been heralded as a foundation of competitive advantage. There have been various efforts to define the learning organization and among the various studies are two remarkable efforts: *The Fifth Discipline* by Peter Senge (1990) and *Sculpting the Learning Organization* by Watkins and Marsick (1993). The term *learning organization* was defined in these publications as follows:

> The learning organization is an organization that possesses not only an adaptive capacity but also "generative" – that is, the ability to create alternative future. (Senge, 1990, p.14)
>
> The learning organization is one that learns continuously and transforms itself… Learning is a continuous, strategically used process-integrated with and running parallel to work…Learning also enhanced

> organizational capacity for innovation and growth. The learning organization has embedded systems to capture and share learning. (Watkins & Marsick, 1993, p. 8)

In the more practical perspective, Slater and Narver (1994) defined a *learning organization* as one that continuously acquires, processes, and disseminates knowledge about market, products, technologies, and business processes, and this knowledge is often based on experience, experimentation, and information provided by customers, suppliers, competitors, and other sources (Ellinger, Watkins & Bostrom, 2000). Other researchers claim that learning organizations are generally market-oriented and have an entrepreneurial mission, a systematic structure, a flexible process, and transformational facilitative leadership (Ellinger, Watkins & Bostrom, 2000; Lundberg, 1991; Slater & Narver, 1995: Watkins & Marsick, 1993, 1996).

The following commonalities, focusing on the definition and basic assumptions of learning organization, were drawn from the various reviews of literature: (a) the learning environment-related factors, (b) the continuous learning process within the organization; (c) the system-oriented learning structure, (d) the autogenously learned and knowledge creation environment, and (e) the performance and goal-oriented learning systems. Based on the remarkable previous efforts, authors re-defined the learning organization in a perspective of substantiality regarding contextual integrated theory:

> The learning organization is structure-based learning environment factors, which trigger individuals' learning and knowledge transformation autogenously for the promotion of continuous and spontaneous organizational learning process within organization itself. The learning organization is the fundamental culture and structure for taking the market advantages through the performance improvement.

Knowledge management. Interest in knowledge management has grown dramatically in recent years as more people have become conscious of its potential to constrain innovation and achieve better performance (Cavaleri, 2004). The concept of knowledge management is more narrowed down and more specifically structured from the perception of organizational learning. In this regard, knowledge management is a more tactic-oriented and system-focused supportive concept for learning organization. It might be true that it is not easy to define *knowledge management*. The field of knowledge management contains many systematic practices and organizing efforts in organizations: creation, retention, succession, and management of learned knowledge in organizational levels (DeLong, 2004; Nonaka & Toyama, 2003; Wenger, 1998).

There are numerous approaches to delineate knowledge management practices, and one of the most common and widely known might be the community of practice. The following definition was represented by Wenger, McDermott and Snyder in their *Harvard Business Review on Organizational Learning* (2002):

> A community of practice is a group of people informally bound together by shared expertise and passion a joint enterprise….Regardless of the circumstances that give rise to communities of practice, their members inevitably share knowledge in free-flowing, creative ways that foster new approaches to problems….The purpose of the community of practice is to develop members' capabilities; to build and exchange knowledge (pp.1-6).

In a more specific perspective, DeLong (2004) stressed the importance of knowledge succession and retention in his book *Lost Knowledge*. Providing several business cases in various organizations, including NASA, Shell, Northrop Grumman, and The U.S. Department of Energy, he defined *knowledge retention* as

> Knowledge retention is effectively the act of building organizational memory…. Knowledge retention is more action-oriented, and knowledge retention also describes a solution to a critical problem that affects performance….Knowledge retention consists of three activities-knowledge acquisition, storage, and retrieval (DeLong, 2004, p.24).

Of course, all of the detailed schemes could not be explained only through these concepts. However, the following perceptions of the knowledge management practice were drawn: (a) knowledge management consists of certain practical activities based on human socialization; (b) various practices of knowledge management are action-oriented; and (c) knowledge management is systematic practices for the effective sharing and transformation of learned knowledge.

Findings

Along with the critically reviewed relevant literature (e.g., 8 studies for individual learning; 16 studies for organizational learning; and 13 studies for knowledge creation) following core themes were identified to create a theoretical alliance among individual learning, organizational knowledge creation, and continuous organizational

knowledge formation: (a) individuals' tacit knowledge is stimulated by learning modes; (b) individuals' tacit knowledge is converted into the organizational explicit knowledge through the collaborative socialization process; (c) organizational explicit knowledge is re-created into the actionable knowledge through supportive environment and continuous interactions; and (d) re-created organizational knowledge could be transferred to the workplace, and embedded into the organizational knowledge through the organizational knowledge formative internalization and shared mental model. In a broader perspective, all of the knowledge formation process has been influenced by the following factors: (a) organizational strategies, (b) organizational learning process, (c) organizational environment, and (d) systematic knowledge management. In order to describe the visible inter-correlations among each feature, a conceptually integrated roadmap of the organizational knowledge formation is illustrated in Figure 2:

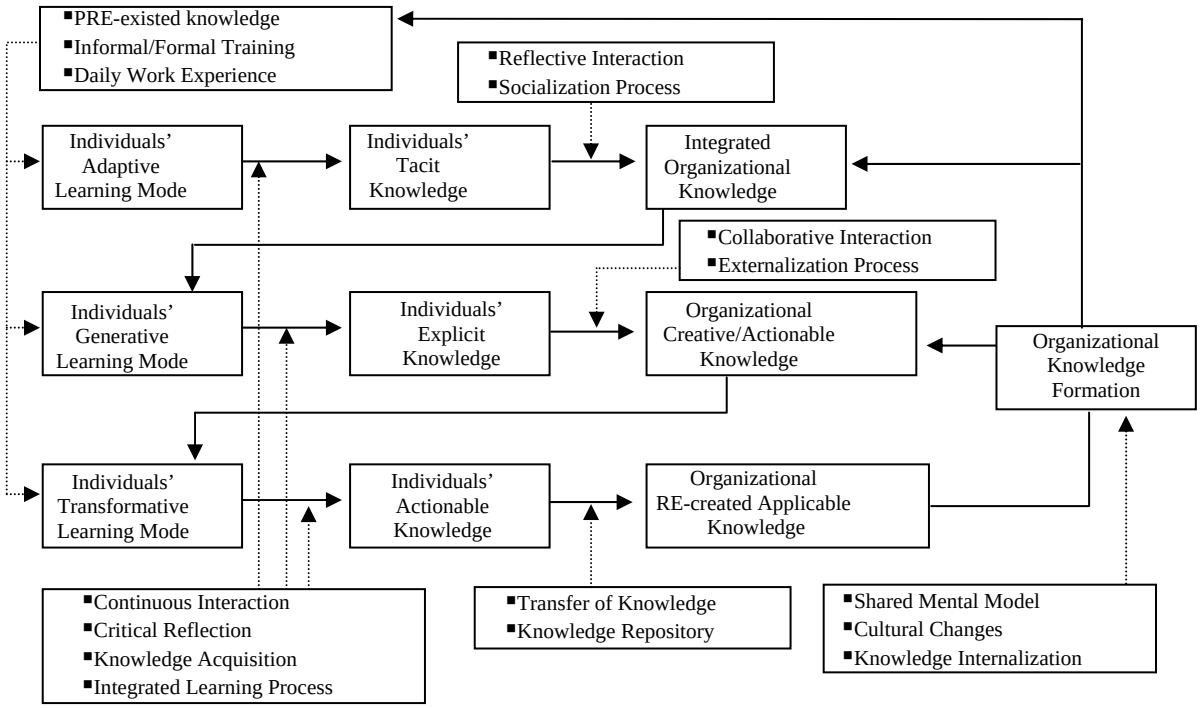

Figure 2. Theoretically integrated conceptualization of organizational knowledge formation process through the socialization, externalization, knowledge repository, and internalization with alliances of continuous learning, interaction, and knowledge management system

RQ1. What are the critical factors to promote individual learning in each of the learning process?

The organizational learning process and knowledge creation are critically associated with the individuals' learning process (Argyris & Schon, 1978; Garvin, 1992; Senge, 1990; Watkins & Marsick, 1993). In organization, furthermore, organizational supportive environmental factors are core catalysts for the promotion of an effective learning process (Gilley & Maycunich, 2000; Chen, Holton & Bates, 2005; Holton, Chen & Naquin, 2003). In a perspective of organizational knowledge creation, communication, socialization, and interactions are significant themes for the individuals' creativity. In a more practical perspective, the organizational knowledge management system could be the better practical sponsor for the applicable knowledge creation process (DeLong, 2004; Wenger & Snyder, 2001).

From an individual learning standpoint, the learning process is essentially related to the pre-dominant knowledge and given environment, especially for the adaptive learning process (Sessa & London, 2006). The individuals' adaptive learning process is an effort to demonstrate a relatively permanent change in behavior in reaction to a stimulus in the given external environmental factors, which is a learning type exemplified in the behaviorist (Pavlov, 1927, as cited by Sessa & London, 2006; Skinner, 1971; Thorndike, 1932; Reber, 1993). To date, this type of learning has been little considered to take advantage of the organizational learning concept; however, the individuals' adaptive learning process could be the key element for the learning-based organizational changes (Sessa & London, 2006).

In the generative learning process, which is associated with the cognitive-oriented learning theory, individuals are generating explicit learning through the internal mental process through the socialization and knowledge

restructuring practices (Bandura, 1986; Bruner, 1960; Gagne, 1978). During this learning practice, individuals could have continuous interactions based on interpersonal knowledge and behaviors, inter-group collaborative teamwork, and organizational environment (Bandura, 1986; Rotter, 1966; Sessa & London, 2006).

Regarding the transformative learning of individuals, which has been theorized form the constructivism learning theorists, individuals are re-create meaning and value of their knowledge from the various experiences of learning practices (Dewey, 1900; Piaget, 1952). More recently, this type of transformative learning is related to the organizational double-, and triple-loop learning concept of Aryris and Schon (1978). In this process, individuals' learning occurs from the trial/error-reflective and re-generative process through the alliance with re-construction from past experience, re-utilization from the organizational knowledge repository, and re-creation through the shared interaction (Sessa & London, 2006). More seriously, this transformative learning is decisively correlated with strategic application of learning transfer into workplace (Gallo, 2004; Sessa & London, 2006).

RQ2. What are the required sequential factors to promote continuous organizational knowledge formation?

One of the key factors to take advantage of organizational performance improvement through the individuals' knowledge asset is containing and retaining organizational knowledge (DeLong, 2004). Along with the repeated circulative knowledge formation processes, organizational knowledge could be re-created and re-generated through the continual transfer of learned knowledge. Ultimately, undefeatable organizational knowledge could be formed, and it could be embedded into the shared mental models (Nonaka, Toyoma, 2003; Nonaka, Peltokorpi, Tomae, 2005). The required sequential procedures will be detailed below.

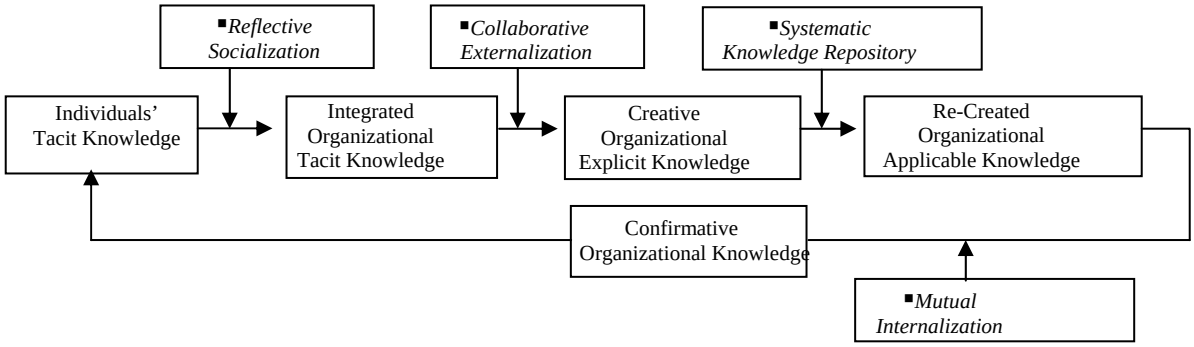

Figure 3. The four steps of organizational knowledge formation -- a theoretically conceptualized process

The first stage is known as a socialization mode, which is adapted from the organizational knowledge creation theory (Nonaka & Takeuchi, 1995). In this stage, through the various individuals' learning modes, with an alliance with continuous communication-based interaction, the individuals' tacit knowledge could be converted into the integrated organizational knowledge. This type of integrated organizational tacit knowledge is curved toward the individuals' generative learning mode (Nonaka, Takeuchi & Umemoto, 1996).

The second step is conceived as a collaborative externalization process, in which individuals' generated knowledge could be transformed into organizational explicit knowledge through the individuals' re-generative knowledge-based collaboration practices. Along with this practice, creative organizational knowledge could be created. This mode influences on the individuals' transformative learning process by supporting of various organizational-structures and environments.

The third step is related to the practice-oriented approach, which is called the knowledge repository. Currently, organizations are struggling with their knowledge management system to retrieve their existing knowledge (DeLong, 2004). In this regard, one of the key systems of the organizational knowledge formation process is knowledge repository, in which organizational knowledge and practices are filtering and re-organizing for the creating new knowledge and practices. These systems are including not only a technology-based knowledge management system but also a community of practice and knowledge succession and retention interventions. This system-oriented approach is a fundamentally supportive factor for the creation of organizational knowledge. Finally, organizational knowledge in this repository could be transferred to the workplace in both effective and efficient applications.

The last, but the most significant, step -- mutual internalization -- is a continuous process of knowledge formation. According to the concepts of double-loop learning (Argyris & Schon, 1978) and mental model of the learning organization's discipline (Senge, 1990), created and applied knowledge in organization could be embedded

into organizational norms and cultural aspect. Through this internalization process, organizational explicit and applicable knowledge could be embedded into the individuals' mental models. This type of organizational knowledge could be organizational confirmative knowledge, and which could be the foundation of the circulative process of knowledge re-creation process. Organizational confirmative knowledge could be created through the cases of successful knowledge applications and shared potentially applicable knowledge in bigger than group-level interactions. And then, stimulating individuals' tacit knowledge and organizational shared mental models -- based on the confirmative organizational knowledge -- could promote continuous collaborations for the repeated processes of organizational knowledge creation. This knowledge formation is not one-circle process; this process could be continuously circulated based on the support of organizational structure, culture, and management system.

Implications and Further Research

According to previous research on the roles and competency of human resource (HR) and organization performance improvement practitioners, more focus has been given to the broader competencies related to an overall strategic planning and performance-oriented approach beyond simple training delivery and implication (Dubois & Rothwell, 2004; Rothwell & Sredl, 2000). More recently, more focus has been given on the organizational knowledge creation and knowledge retention (DeLong, 2004)

In these regards, the understanding of the conceptually integrated knowledge formation process could shed light on the overall strategic planning of HR-based performance improvement and knowledge-based competitiveness. The theoretically combined organizational knowledge formation process is providing not only the holistic view of the learning organism but also practical understanding of core themes of knowledge creation. According to the given conceptual knowledge formation system, PI practitioners need to encourage the supportive and positive work environment in terms of open-communication system and continuous interactions. Furthermore, practitioners should consider the value human activity-based knowledge creating practices as important as the technological knowledge management system. Finally, the practitioners whose task is more concerned with organizational policy- and strategy-making could apply each of the current roadmap of knowledge formation for the purpose of reflecting on the theoretically interconnected factors for successful implications.

This research may not provide specific tools of applications since the primary method and purpose of the research was to provide a conceptual basis for further investigation. This paper is a critical interdisciplinary literature review, and this research provides a theoretically integrated concept by way of systemic triangulation of multiple aspects in terms of individuals' learning modes, organizational knowledge creation, and performance-oriented knowledge formation.

For the sake of providing a more empirical research-based theory, future research needs to identify the interrelations among the factors based on the rigorous item development study, and assessment of the measurement construct. Another possible research method to provide the empirical evidence of research validation is to conduct case studies based on the best business stories that contain the performance-based knowledge creation cases.

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