11-28-2016

Expanding the Model of Organizational Learning: Scope, Contingencies, and Dynamics

Barbara Grah

Vlado Dimovski

Charles C. Snow

Judita Peterlin

Follow this and additional works at: <https://www.ebrjournal.net/home>

Recommended Citation

Grah, B., Dimovski, V., C. Snow, C., & Peterlin, J. (2016). Expanding the Model of Organizational Learning: Scope, Contingencies, and Dynamics. *Economic and Business Review*, 18(2). <https://doi.org/10.15458/85451.21>

This Original Article is brought to you for free and open access by Economic and Business Review. It has been accepted for inclusion in Economic and Business Review by an authorized editor of Economic and Business Review.

EXPANDING THE MODEL OF ORGANIZATIONAL LEARNING: SCOPE, CONTINGENCIES, AND DYNAMICS

BARBARA GRAH¹
VLADO DIMOVSKI²
CHARLES C. SNOW³
JUDITA PETERLIN⁴

Received: March 19, 2015
Accepted: November 2, 2015

ABSTRACT: *Our paper seeks to contribute to the understanding of organizational learning by (a) integrating existing models of organizational learning into a single model and (b) expanding the model to include inter-organizational learning, adding key contingencies suggested by the growing literature on neuroleadership, and incorporating a process dimension to reflect the fact that organizational learning is continuous and dynamic. The resulting expanded model of organizational learning encompasses four levels on which learning can occur: individual, team, organizational, and inter-organizational. The overall validity of the model is illustrated by applying it to two knowledge-intensive Slovenian firms. Implications for theory and practice are discussed.*

Keywords: *organizational learning, organizational learning model, inter-organizational learning, neuroleadership*

JEL Classification: M1, M12

DOI: 10.15458/85451.21

INTRODUCTION

In the contemporary environment, the key organizational resource is knowledge (Miles, Snow, & Miles, 2000). To be competitive in the global economy, organizations need to learn how to continuously adapt by both acquiring and generating knowledge and, increasingly, by sharing and co-creating it with clients, suppliers, partners, and other stakeholders. Moreover, organizations need to be able to absorb and apply new knowledge quickly due to the constant changes within the global competitive environment, as managing firms has never been so challenging and difficult, especially for firms operating in complex, dynamic environments (Breznik & Lahovnik, 2014).

Existing models of organizational learning tend to be static and do not address important contingencies that affect the learning process (Crossan, Maurer, & White, 2011). In

1 University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia, e-mail: barbara.grah@ef.uni-lj.si

2 University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia, e-mail: vlado.dimovski@ef.uni-lj.si

3 The Pennsylvania State University, USA

4 University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia, e-mail: judita.peterlin@ef.uni-lj.si

addition, learning is often characterized as a reaction to environmental change (Kim, 1993; March & Olsen, 1975) rather than a proactive, collaborative process among involved stakeholders. These and other limitations indicate that existing learning models need to be combined into a single comprehensive model that includes a broader scope, key contingency factors, and a dynamic focus.

We articulate a new model of organizational learning that builds on previous models and adds missing elements, using Huber's (1991) model as the basic building block. In order to develop a model of organizational learning that meets the needs of contemporary organizations, we first systematically review the research literature on organizational learning in order to identify key variables and relationships as well as theoretical limitations. Then, we discuss the main factors that are under-emphasized or missing in the existing models. Those factors include learning at the *inter-organizational level*, *contingencies* suggested by the rapidly expanding literature on neuroleadership, and *dynamics* that represent learning as a continuous process rather than a discrete, periodic activity. Third, we assess the general applicability of our expanded model by using it to analyze two firms in the Slovenian information technology industry that are recognized for their learning capabilities in order to provide empirical support for of the expanded model. Lastly, based on our model-building efforts, we develop implications for theory and practice in the area of organizational learning.

The 21st century global business environment is complex, dynamic, and highly competitive (Chen & Miller, 2015). This environment has caused disruptions in many industries and has put enormous pressure on organizations to learn and adapt quickly. Organizations that know how to collaborate with key stakeholders and to learn continuously will be able to gain competitive advantages. We believe our expanded model of organizational learning will help managers and organizational designers to develop more adaptive organizations.

1 ORGANIZATIONAL LEARNING

The field of organizational learning focuses on the processes of learning within and between organizations (Hernaus, Škerlavaj, & Dimovski, 2008) at four different levels: individual, team, organizational, and inter-organizational (Crossan, Lane, White, & Djurfeldt, 1995). Kim (1993, p. 38) defined individual learning as "the acquiring of knowledge or skill" encompassing the "know-how" and "know-why." Team learning is defined as cohesive collective individual learning resulting in shared mental models. Organizational learning is "increasing an organization's capacity to take effective action" (Kim, 1993, p. 43). Based on the analogy with organizational learning, inter-organizational learning is defined as increasing the capacity to take effective action within a group of organizations (Yang, Ou, Chou, Fang, & Fang, 2011) or by advancing Huber's (1991, p. 89) words: "a group of organizations that continuously learn(s), if, through processing of information, the range of their potential behaviors is changed".

1.1 Existing Models of Organizational Learning

Different models and explanations of the organizational learning process exist in the literature. The four most cited models are presented chronologically, and additional models are presented in Table 1.

March and Olsen (1975) explained that the basis for individual actions comprises individual cognitions, preferences, and beliefs. Individual actions lead to organizational actions, which cause environmental responses, which in turn affect individual cognitions, preferences, and beliefs, thus completing the circle of organizational learning. In their model, the environment drives the process of organizational learning that occurs when the whole cycle is completed. Kim (1993) later advanced the model by substituting individual beliefs with the OADI-IMM model of individual learning and emphasizing individual learning on the conceptual and operational levels and individual mental models as well as shared mental models.

Huber (1991) focused on the information processing perspective and associated the process of organizational learning with four crucial constructs: (1) knowledge acquisition, (2) information distribution, (3) information interpretation, and (4) organizational memory. Knowledge acquisition is a process of obtaining knowledge and is further defined by five sub-constructs: (a) congenital learning or drawing on knowledge existent at the time of the establishment of an organization, (b) experiential learning or learning from direct experience, (c) vicarious learning or learning from the experience of others, (d) grafting and acquiring new members that possess knowledge not possessed in an organization before, and (e) searching for and noticing information about the organizational environment and monitoring its effectiveness. Information distribution is a process of sharing information from different sources among organizational members to create new information. Information interpretation is the organizational process of interpreting and giving information meaning. The extent of the new information is determined by (a) existing cognitive maps and framing information during communications, (b) richness of the media used to send information in terms of a sender and receiver to give it a common meaning, (c) information overload, and (d) amount of unlearning (Huber, 1991). Organizational memory consists of storing and retrieving information and computer-based organizational memory (Huber, 1991).

According to Crossan, Lane, and White's (1999) 4I model, organizational learning is conducted on three levels: individual, group, and organizational. Four social and psychological processes link the three levels of learning, which transform tacit knowledge into explicit knowledge and intuition into institution. Crucial to this model is the interactive relationship between cognition and action throughout the feed-forward and feedback processes that add a dynamic dimension. These four processes are (1) intuiting at the individual level, (2) interpreting at the individual and group levels, (3) integrating at the group and organizational levels, and (4) institutionalizing at the organizational level.

1.2 Theoretical Limitations of the Existing Models

The main theoretical limitation of March and Olsen's (1975) model and Kim's (1993) model is that they do not incorporate inter-organizational learning. March and Olsen (1975) claimed independence of organizational action and environmental response, which clearly excludes inter-organizational learning. In both models, other organizations are perceived as part of the environment, which presents an environmental response to organizational action and changes individual beliefs (March & Olsen, 1975). In Kim's (1993) model, these actions are caused by individual or organizational actions that affect individual learning. The environment is perceived in terms of representing shocks (March & Olsen, 1975, p. 157), not as offering opportunities to learn together and co-create the future. Despite the fact that both models show dynamics and emphasize continuity, they also indicate, but do not sufficiently emphasize, the importance and interactions of different contingency factors.

On the other hand, Huber's (1991) information processing view is static, as it does not integrate the continuity of the organizational learning process, which requires the application of gained knowledge and feedback that form the basis for new loops of organizational learning (Crossan et al., 1999). In addition, Huber's (1991) model does not incorporate the contingency perspective that would enable information to be processed successfully; therefore, this model can be considered universally applicable. In addition, it does not discuss inter-organizational learning, although the subject could be understood implicitly from the model.

The main limitation of the 4I model (Crossan et al., 1999) is the explicit division of the 4I elements into only three levels of learning. Organizations can learn from and with other organizations, as evidenced by platform strategies (e.g., Android and numerous others) and knowledge sharing within organizational networks, yet no specific element of the 4I model incorporates inter-organizational level learning explicitly. The contingency dimension is also not addressed sufficiently, although it is somehow indicated: for example, by pointing to the need to further investigate the role of leadership in the organizational learning model and by mentioning an organizational structure and strategy next to other institutionalized processes. However, these aspects are perceived as results of the organizational learning processes and not as conditions for organizational learning to occur. Therefore, these factors play a passive role in relation to the four social and psychological processes. The summarized theoretical limitations of organizational learning models are presented in Table 1.

Table 1: *Theoretical Limitations of Organizational Learning Models*

Model	Inter-organizational level	Contingency dimension	Dynamic dimension	Limitations/ context
The Complete Cycle of Choice (March & Olsen)	No	Not emphasized explicitly	Yes	- focus on cycle of choice - no team level (Crossan et al., 1999) nor inter-organizational - conceptual
OADI-IMM model (Kim)	No	Not emphasized explicitly	Yes	- no team and inter-organizational level - conceptual
Information processing (Huber)	Not emphasized explicitly	No	No	- inter-organizational learning level could be implicitly assumed - conceptual
4I model (Crossan, Lane & White)	No	Not emphasized explicitly	Yes	- no inter-organizational level - conceptual and verified
5I model (Jones & Macpherson)	Yes	Not emphasized explicitly	Yes	- focus on SMEs - qualitative research
Dynamic model of intra- and inter-organizational learning (Holmqvist)	Yes	Partially	Yes	- intra-organizational level (individual, team and organizational as one level) - conceptual
Conceptualizing the learning process (Zhang, Macpherson, & Jones)	Yes	Partially	Yes	- focus on SMEs - qualitative research - verification
A conceptual framework for the management of organizational learning (Pawlowsky)	Yes	No	Yes	- conceptual

Organizations do not learn constantly or at the same speed and quality, and some do not practice organizational learning at all, as their contingencies do not support organizational learning. Those models do not fully include any denotation of contextual factors. On the other hand, if an organization processes the information to produce knowledge but only stores it, an important opportunity to learn is missed, as every application of acquired knowledge gives feedback information, which then serves as the source for a new cycle of learning. As evident from Table 1, the dimensions have been partially addressed before; however, none of the existing models incorporate (a) four levels of organizational learning, including the proactive role of inter-organizational learning, where the group of organizations learn(s), (b) contingency, (c) dynamic dimensions, and (d) representation with one single model; therefore, these existing models should be integrated and expanded accordingly.

1.3. Organizational Learning and Neuroleadership

The process of individual learning, which is a necessary but insufficient condition for organizational learning (Senge, 1993), is managed by human brains, as individual learning is the basis of and therefore a prerequisite for higher, social-level learning (Jashapara, 2003; Kim, 1993; Senge, 1993). In searching for an answer to how an organization learns, Hedberg (in Romme & Dillen, 1997, p. 69) claims that an organization does not have a brain but has cognitive systems and memories available through which certain behaviors, mental models, and values are retained, resulting in co-influencing the learning of individuals and the storage of new knowledge by organizations, occurring in the form of manuals, procedures, symbols, rituals, and myths. Those manuals, procedures, symbols, rituals, and myths are then again put in action by the human brain. As Vorhauser-Smith (2011) points out, a key process in the brain is learning, conducted through memory.

Neuroscience studies the nervous system, and it is not surprising that the interest in neuroscience is high due to the wide range of possible implications such as, for example, in the area of neuroeconomics (Hubert, 2010) or the implications of neuroscience for leadership. The area is still emerging, and according to Rock (Lafferty & Alford, 2010; 2010), who coined the term, neuroleadership explores how leaders and followers think and transfers the findings of neuroscience to four key leadership domains: (a) the ability to solve problems and make decisions, (b) the ability to regulate emotions, (c) the ability to collaborate with others, and (d) the ability to facilitate change, as presented in Table 2. The relation between leaders and co-workers has changed content wise, as the emphasis is on acknowledging and raising awareness about the thinking process of both leaders and co-workers.

Table 2: *Four Key Domains of Neuroleadership According to Rock*

Decision making	A small part of our brain, the prefrontal cortex (hereinafter: PFC), is responsible for human conscious interactions, problem solving, and decision making. Rock (2009) claimed that conscious mental performance can be improved by overcoming the key limitations of PFC: (1) PFC needs lots of energy, which is a limited resource; (2) people can hold and manipulate only a limited number of pieces of information at the same time; (3) the human brain can accurately perform only one conscious process at a time; (4) attention is easily distracted; (5) fussiness is present; and (6) limitation exists in creative situations, resulting in an increased capacity for problem solving and decision making.
Emotion regulation	Automatic responses to dangers or rewards, even subconscious ones, are perceived as emotions, which play an important role in human thinking, and the ability to regulate emotions is crucial to being effective (Rock, 2009), as cognition and emotions are interrelated. Emotions are seen as triggers and responses to conscious thinking (Hubert, 2010); therefore, it is important to understand, pull back, and detect emotional and cognitive action occurring within the mind and, if needed, constructively regulate emotions.
Collaboration	Along with the human need for food, water, shelter, and a sense of certainty, humans have social needs such as feeling safe among people, a sense of fairness, and a sense of status, which strongly influence how people collaborate (Rock, 2009). For example, obtaining a good reputation or avoiding a bad one is a powerful incentive for human actions (Izuma, 2012), next to the readiness of individuals to act in a way that will increase their personal status and support activities that seem fair (Rock, 2009). To exemplify, an individual who voluntarily and spontaneously engages in positive or negative behaviors, like knowledge sharing or knowledge hiding, will implicitly invoke a similar reciprocal behavior, which affects motivational climate and creativity of the organization (Černe, Nerstad, Dysvik, & Škerlavaj, 2014).
Facilitating change	According to Rock and Schwartz (2006), change is registered in our brain as a threat that triggers the fear response and affects how our brains operate. To overcome resistance to change, repeated attention, or an insight generated from within, is needed, which facilitates change implementation.

Those four domains of neuroleadership are closely related to the organizational learning process, as (a) decision making and problem solving ability focuses on cognition and (b) emotion regulation ability focuses on emotions, which are an important part of individual and organizational processes of learning (Long & Newton, 1997), as the relationship between cognition and affective states exists in both directions. Cognition influences most affective states and informs individuals about the relevance of the situation and previous experience; meanwhile, affective states influence cognition through one's choice of what to perceive and store and by assessing the learning experience as good-bad, pleasant-unpleasant, and important or not (Gondim & Mutti, 2011). Hubert (2010) stressed that emotions often represent unconscious knowledge. (c) The ability to collaborate with others is important for learning, because, according to social learning theory, learning always takes place in the social context (Bandura, 1977) in terms of defining mental maps and beliefs about the world and as people often learn directly from and with others at an individual level. Meanwhile, higher-level learning is social by definition. Nevertheless, changes are an important source for learning, while learning also results in implementing changes.

As those domains are related to learning and are at the same time not too narrowly defined to limit the research, those four dimensions were chosen to streamline the research. At the same time, the novelty of neuroleadership makes a theoretical contribution to the field.

2 RESEARCH METHODOLOGY

2.1 Concept of the Study

Based on the limitations of the existing models of organizational learning discussed above as well as the trends in the global business environment, this study seeks to answer the following question: How can the models of organizational learning be integrated and expanded through contingencies and the dynamic dimension of the organizational learning process on all four levels? Our answer offers an integrated and expanded information-processing model of organizational learning that incorporates organizational learning on all four levels and four dimensions of neuroleadership to emphasize its contingency and dynamic dimensions. According to Jashapara (2011), qualitative studies represent the majority of empirical research on organizational learning. This research was conducted in two parts.

The research design scheme is presented in Figure 1. The first part of the study, encompassing the first three phases, presents the development of the systematic scheme based on the vast literature review and implementation of the coding process. The identified codes were further analyzed and coded using second-level coding, which enabled identification of the contingency and dynamic dimensions in the scientific literature on organizational learning. The analysis offers a solid base to propose the integrated and expanded model of organizational learning. To further verify the contingency and dynamic dimensions of the proposed organizational learning model, an empirical verification is provided.

Figure 1: *Research design scheme*

2.2 Description of the Study and Development of the Systematic Scheme

Based on the limitations of the acknowledged models, Huber's (1991) process was chosen to build upon, for the following reasons: (1) It is the most acknowledged model of organizational learning, according to Web of Science and Google Scholar statistics, as presented in Figure 2. Until July 6, 2015, Huber (1991) was cited 1,956 times according to Web of Science and 7,792 times according to Google Scholar; (2) Huber's (1991) model focused on information processing perspective of organizational learning; (3) it explicitly included grafting and other external sources of learning; and (4) at its core, it does not connect specific phases to specific levels of learning.

Figure 2: Citations of organizational learning models according to Google Scholar and Web of Science

Source: Google Inc., Google Scholar, 2015.

In order to work on the identified limitations of the existing models, we conducted a systematic query on organizational learning. The search framework was designed as a two-dimensional matrix. The first axis of the matrix was defined by different levels of organizational learning, namely individual, team, organizational, and inter-organizational learning, because of the emphasized need to include the inter-organizational learning level in our model. The other axis of the matrix framework was defined using the four domains of neuroleadership: decision making, emotion regulation, collaboration, and change enhancement, which are on one hand closely related to the organizational learning process, and on the other hand broad enough not to limit the search too narrowly.

Based on the literature review per the described matrix framework, the systematic scheme presented in Figure 3 was developed. This scheme represents the theoretical in vivo codes generated from SCI/SSCI cited scholarly articles, denoting summaries and their special features, identified as connecting the dimensions of organizational learning field with the four dimensions of neuroleadership.

First-step theoretical coding was conducted to produce the codes. Two scholarly databases were examined, namely ScienceDirect and Google Scholar. The search criteria integrated both axes. A search was conducted for each possible content interconnection within the two-dimensional matrix, and the results were presented based on their relevance. We examined the first 100 most relevant hits of each linkage in each database. By way of example, for the connection between individual learning and decision making, the search criteria “individual learning and decision making” was used in both databases, and the first 100 hits in each database were scanned.

To narrow the bibliographic database, the first criterion of a SCI/SSCI citation was applied, followed by the second criterion, the relevance of the content. The researchers examined the abstracts, introductions, and discussion sections of each scholarly article and identified 195 relevant peer-reviewed articles, which were read in detail. During the process of classifying articles, keywords were identified for theoretical coding, and the preliminary SCI/SSCI literature review database was validated by another researcher who also focused on the strength of the connections between the dimensions. In addition, the theoretical codes were extracted from the most appropriate articles according to the research framework. The identified codes are presented in Figure 3.

Figure 4: Systematic Scheme of the Identified Theoretical Codes

Organizational learning Neuroleadership	Individual learning	Team learning	Organizational learning	Inter-organizational learning
Decision making	Risk (Dillon & Tinsley, 2008) Analytical detachment and experiential learning (Kolb, 1976)	Individual accountability (Feingold et al., 2008) Application of gained knowledge (Sarin & McDermott, 2003)	Strategic decision-making processes (Shrivastava & Grant, 1985) Explorative and exploitative knowledge (Kang, Morris, & Snell, 2007)	Absorptive capacity (Lane & Lubatkin, 1998)
Emotion regulation	Metacognition (Efklides, 2006) Learning from business failure (Shepherd, 2003)	Collaborative learning, shared regulation (Järvenoja & Järvelä, 2009)	Emotional capability (Algün, Keskin, Byrne, & Aren, 2007)	Relational fit (Weber & Weber, 2007)
Collaboration	Computer-mediated vs. face-to-face collaboration (Ocker & Yaverbaum, 1999) Learning perception, knowledge construction (Benbunan-Fich & Arbaugh, 2006)	Team psychological safety (Edmondson, 1999) Conflict, politics (Adamson & Walker, 2011)	Parallel learning system (Schein, 1993)	Internalized experience, utilization of past experiences, and collaborative know-how (Simonin, 1997) Virtual integration, trust (Scott, 2000) (In)formal learning behaviors (Janowicz-Panaitan & Noorderhaven, 2008)
Enhancing change	Learning synchronization (Chonko, Dubinsky, Jones, & Roberts, 2003) Routine (Hendry, 1996)	Learning facilitation (Edmondson, 2003)	Organizational learning culture (Škerlavaj, Štemberger, Skrinjar, & Dimovski, 2007) Organizational memory and organizational change (Van der Bent, Paaue, & Williams, 1999)	Institutionalization of external knowledge (Jones & Macpherson, 2006)

Note: The type of box reveals the coverage of the identified research articles in a certain category between two chosen dimensions based on the search (thick bold line: very well-researched area; highlighted line: well-researched; normal line: poorly researched; dashed line: under-researched)

All identified codes were further analyzed and coded on the second level (see Table 3). All of the existing four processes of Huber's (1991) model were used on the second level as well as two additional processes, *learning inhibitors and facilitators*, causing appropriate learning environment denoted by individual accountability, metacognition, team psychological safety, conflict, politics, virtual integration, trust, (in)formal learning behaviors, risk, strategic decision making processes, routine, learning facilitation, and the first-level code of organizational learning culture, which denoted the contingency dimension. The dynamic dimension of organizational learning was coded as the process of *knowledge application and feedback information – information transformation* on the second-level coding and denoted the following first-level codes: application of gained knowledge, learning from business failure, internalized experience, utilization of past experiences and collaborative know-how, and explorative and exploitative knowledge.

Table 3: *Analysis of Identified Codes*

First-level code	Second-level code
Individual accountability	Learning inhibitors and facilitators
Metacognition	
Team psychological safety	
Conflict, politics	
Virtual integration, trust	
(In)formal learning behaviors	
Risk	
Strategic decision making processes	
Routine	
Learning facilitation	
Organizational learning culture	Knowledge acquisition
Analytical detachment and experiential learning	
Parallel learning system	Information distribution
Absorptive capacity	
Computer-mediated vs. face-to-face collaboration	
Relational fit	Information interpretation
Learning perception, knowledge construction	
Collaborative learning, shared regulation	Organizational memory
Learning synchronization	
Organizational memory and organizational change	
Institutionalization of external knowledge	Knowledge application and feedback information – information transformation
Application of gained knowledge	
Learning from business failure	
Internalized experience, utilization of past experiences and collaborative know-how	
Explorative and exploitative knowledge	

Based on the analysis of identified codes, the Diamond model of organizational learning was developed.

2.3 Empirical Verification of the Theoretical Study

Because knowledge acquisition, information distribution, information interpretation, and organizational memory are already well-established processes in theory and practice, the empirical evidence emphasizes the additional two identified codes, (1) learning inhibitors and facilitators and (2) knowledge application and feedback information – information transformation, which denoted the contingency and dynamic dimensions.

Illustrative examples of the second-level codes of learning inhibitors and facilitators and knowledge application and feedback information – information transformation were identified in two high-tech organizations that practice organizational learning process systematically and continuously. There are two main reasons why this industry was chosen (Yang et al., 2011): (1) The high-tech industry is knowledge intensive, and therefore organizations must cooperate with external partners to gain additional resources, and (2) the high-tech industry is rapidly changing; therefore, the cooperation among R&D and technology departments is vital. Halcom Group and Si.mobil were identified as the most appropriate organizations (Dimovski, Penger, Škerlavaj, & Žnidaršič, 2005) in which to highlight the organizational learning dynamic and contingency dimensions. Specifically, these organizations offer important contributions to the advancement of learning organizations in the Slovenian knowledge-intensive business environment, and the researchers were also able to access these organizations to collect in-depth primary qualitative data in addition to the vast amount of secondary data that were available. This research is part of a larger research program that takes place in the period of 2012 onward. The interviews lasted from 0.5 to 2 hours, and all of them were recorded and transcribed. In order to provide quotations for the empirical verification of this study, 5 interviews and 2 focus groups were used. Proof quotations (Pratt in Langley, 2012) were sought in Halcom and Si.mobil for each dimension to highlight and support the two identified second-level codes empirically, namely learning inhibitors and facilitators and the application of gained knowledge and feedback information – information transformation.

3 RESULTS OF THE STUDY

3.1 Emergence of a Diamond Model of Organizational Learning

Several different models of organizational learning exist, each with advantages and limitations, as presented in Table 1. The proposed theoretical integration and expansion is built on Huber's (1991) process, based on the identified second-level codes, is presented in Figure 4.

Figure 4: *Diamond model of organizational learning*

When designing the model, special emphasis was given to the four advancements of the existing model: (1) its contingency dimension, (2) its dynamic dimension, (3) its inclusion of all four levels of learning, and (4) its inclusion of neuroleadership.

(1) Networks do not learn at the same speed and quality, and neither do organizations, teams, or individuals. Even more differences in learning exist that determine the learning process, its quality, and continuity, and therefore these contextual factors are of crucial importance. The learning inhibitors and facilitators' code denoting the contingency dimension is positioned at the center of the model. Different contextual factors are grouped into one element for three reasons: (a) Those factors affect organizational learning on all levels, as levels of learning are inter-related. If those factors do not support and encourage learning on any of these four levels, then organizational learning will not truly occur continuously and systematically. For example, metacognition might be a characteristic of individuals and therefore of individual-level learning; however, individual-level learning is a necessary but insufficient condition for organizational learning. (b) One facilitator could facilitate or inhibit learning on several levels (e.g., organizational learning culture – if it is supportive of learning, it affects learning on all four levels, not only organizational-level learning), and (c) it keeps the model comprehensible. In naming contingencies, we follow Fiol and Lyles (1985), also quoted by Bapuji and Crossan (2004). Those contingencies can be supportive of learning or not, and in the case that it is not supportive, organizational learning will not (fully) take place.

(2) The continuity of the organizational learning process is represented with a diamond shape of the model, emphasizing that organizational learning is not linear, but is a continuously looping process. Coded as knowledge application and feedback information – information transformation, it denotes the need to implicate the knowledge. This knowledge application provides feedback information and transfers the information into new one(s) providing the basis for new cycle of organizational learning. Only if information is transferred into new information can the organizational learning be a continuous process. However, the phases need not be sequential once the organizational learning is established; therefore, the five phases are represented by the outer form of the diamond structure, each connected to an element of the learning inhibitors and facilitators. Time lag might exist before the knowledge application; however, it facilitates building on, modification of, and advancement of existing knowledge.

(3) The proposed Diamond model of organizational learning includes all levels of organizational learning, and also each of the non-central five phases in the model could be implemented at each organizational level; for example, organizational memory denotes all levels of memory, similar to organizational learning, which denotes learning on all four levels. Namely, each level can have its own knowledge repositories that in the long term also reflect lower levels and constitute higher levels of knowledge storage. The model also does not limit specific phases with a specific level of learning; the process can, but not necessarily will, take place within and among different levels in one cycle, and the transformed information could start a new cycle on a different level. As this is a continuous process, information and knowledge are shared among learning levels and entities in several cycles, and it does not just reside in a form of some rules, processes, politics, or manuals at the organizational level. It is important to note that for inter-organizational learning to truly occur, it is not enough that a single organization learns something from other organizations. Rather, more than one organization has to learn in the continuous process of learning among involved organizations, and from and with other organizations. It is a collaborative, reciprocal process.

(4) Nevertheless, through practicing the neuroleadership domains, the contextual factors (contingency dimension) that stimulate organizational learning are established that further support and enhance the dynamic process of information processing (dynamic dimension) of all five components: knowledge acquisition, information distribution, information interpretation, organizational memory, and knowledge application and feedback information – information transformation that stimulates new knowledge acquisition. However, neuroleadership cannot be understood as the only means for building appropriate contextual factors, rather, it should be understood as the model limitation. Also, other means to achieve it might exist; however, it exceeds the focus of this research.

3.2 Empirical Verification – Illustrative Examples of Two Knowledge-Intensive Organizations: Halcom Group and Si.mobil

Headquartered in Ljubljana, Slovenia, Halcom was established in 1992. Since then, it has become a leading provider of electronic payment system solutions in Central and Southeast Europe, and it is renowned for its excellent e-banking and e-invoicing advancements (Čadež, 2014; Halcom, 2014, n.a.; Kostelec, 2012), which positions Halcom as one of the most advanced knowledge-intensive organizations in local markets. The numerous awards for excellence Halcom has received indicate its dedication to excellence. Halcom's incubator of ideas, Halcom Studio, engenders a culture of innovation within and outside the organizational borders. Halcom engages in the process of organizational learning continuously on all levels.

Halcom's good practices support its formal learning process to develop soft skills and expert knowledge; for example, a Friday knowledge market is held to share knowledge on a chosen topic with co-workers; annual interviews are held to identify appropriate courses or conferences for employees; higher education is offered for employees, and an academy for top managers; and webinars, classical courses, exams, and other formal learning opportunities are provided to acquire certificates. In addition, Halcom practices informal procedures: for example, dedicating specific months to each Halcom value, practicing teamwork, or holding regular meetings with people from its subsidiaries during which they can share experiences and keep up to date (Čadež, 2014).

Si.mobil is the second largest mobile operator and service provider in Slovenia that practices organizational learning continuously. Organizational learning in Si.mobil emphasizes the Internal Competencies Identification System, Si.mind program, Potential and Talent Development Program, Program of Keeping Key Human Resources, Engagement Program, Pay for Performance Award System, Role Model Program, and Simplicity Program. Employees regularly take part in the Si.mobil Academy, x.change program, online application TAG Business School 2.0, and TAG Business School in Vienna as participants or internal lecturers in which they share their gained knowledge and experiences to adjust or apply new knowledge to organizational substructures.

3.2.1 Contingency Dimension

The contingency dimension should be understood as a necessary, although insufficient, condition for organizational learning to take place. The collected empirical evidence from both studied examples showcase special care on building and maintaining appropriate learning facilitators, as demonstrated by the following quotations:

QUOTATION 1 - Mr. Čadež:

"Basically, Halcom cultivates the virtue that the leader is not the ultimate executor or thinker, but is an integrator that nurtures thinking process of his followers"

The quotation of Čadež denotes individual accountability, virtual integration, trust, (in) formal learning behaviors, learning facilitation, and organizational learning culture codes. It clearly expresses the need to create an environment that will support thinking and learning of all co-workers, which is also in line with the neuroleadership perspective that leaders should cultivate the thinking process of co-workers and not do all the thinking to solve problems and make decisions instead of them.

QUOTATIONS 2 - Mr. Zupan:

“Halcom is focused on developing new ideas and prototypes and not on the projects and sales themselves; that would leave us to the price competition. Competitors might reengineer and copy our products and solutions; however, they are always lagging behind; as we go to our clients, talk with them about possible solutions, we get to know how our clients think, we learn together with clients, and this gives us the competitive advantage in relation to our competitors. [...] For building creative minds, we have started with Qi Gong yoga classes, as we are practicing half an hour yoga, or math, or physics... Every day of the week we have something; for example, on Fridays, we have creative challenges, including improv theatre and dancing, to nurture the creativity of our employees”.

The first part of this quotation denotes the (in)formal learning behaviors, strategic decision-making process, and routine codes and emphasizes inter-organizational learning together with clients, which the contextual factors need to support (e.g., focus on exploration, not sales and price competition), which ultimately bring them a competitive advantage due to challenging status quo and implemented changes. Furthermore, they also practice a “Building creative minds” initiative that is in line with the neuroleadership perspective to overcome the limitations in creative situations (e.g., by focusing on other things and allowing insights to happen), and to build and encourage collaboration among employees (e.g., through practicing together) that also evokes positive emotions (e.g., yoga classes).

QUOTATIONS 3 - Mr. Miladinović - part 1 and Mr. Krajner - part 2:

“Si.mobil has a competency model for developing leadership competencies according to which leader at Si.mobil needs to be a role model in all he does in a positive sense. He needs to make decisions fast, be efficient in difficult situations, be critical, and not be easily satisfied. Of course, he does also praise others when they do something extraordinarily well or unexpected. In addition, he needs to aspire toward change in order not to be static”. [...] The most important thing in stress management in the organization is communication. People need to be told what is going on, sincerely. Personal contact is crucial and as much possibilities of seeing the CEO are needed. Dejan Turk is the best stress reliever: he walks around the company, knows the names of the employees, and demonstrates concern for employees. Leaders are those that must work on stress management the most. We invest a lot into educating leaders how to deal with changes. It is logical; employees first look up to us”.

The first part of the quotation denotes individual accountability, team psychological safety, risk, strategic decision-making processes, and learning facilitation codes. Leaders

are the learning facilitators or inhibitors in practice, as co-workers look up to them for behavioral benchmarks and their behaviors become “the way we do things around here” – principles of organizational culture. Due to the hectic business environment in advanced knowledge-intensive organizations, decision makers inside the company must take on the wider responsibility for decisions made, and the strategic decision-making process always considers core business at the center of their attention. Due to the specific management style, appraisal for good work is instant, and initiatives are highly welcomed; therefore, shared leadership is a way to establish balance between individuals’ accountability and team psychological safety. The second part of the quotation denotes individual accountability, metacognition, team psychological safety, conflicts/politics, (in) formal learning behaviors, risk, strategic decision-making processes, learning facilitation, and organizational learning culture. Issues that are important to employees need to be formalized in the educational system of the company.

QUOTATION 4 - Attendee at Si.mobil Focus Group November 30, 2012:

“We act as the creators of new technologies in Slovenia, as; for example, we introduced cloud services, for which we have to educate and nurture our environment to achieve targeted business results”.

The quotation denotes virtual integration, trust, risk, strategic decision-making processes, and learning facilitation codes, demonstrating the importance of organizational learning in introducing a new technology to the market that is accompanied by risk and the need to prepare potential consumers for its usage.

As evident, the contingency dimension plays an important role in the organizational learning process, as it can foster and nurture or inhibit the organizational learning process itself. When the appropriate environment for organizational learning is established, knowledge acquisition, information distribution, information interpretation, organizational memory, and knowledge application and feedback information – information transformation can take place at individual, team, organizational, and inter-organizational levels of learning within the network or group of organizations that cooperate or collaborate in one or other way and therefore learn together on a continuous basis.

3.2.2 Dynamic Dimension

The dynamic dimension was denoted as the application of gained knowledge and feedback information – information transformation. This dimension enables the continuity of information processing; therefore, the organizational learning process itself is understood as a continuous process, not a linear one. The gained knowledge should be applied in practice to enable feedback in terms of lessons learned, which should serve as the basis for another loop of learning.

QUOTATIONS 5 - Mr. Čadež:

“I say that no learning activity is too expensive, if it has an appropriate effect, as well as that no learning is too cheap if it has no effect whatsoever. [...] One of the most important things is that the leader gives an example of openness, positivism, optimism, as well as accepting facts that mistakes are made; however, we need to learn from them. [...] Crucial activity in a successful organization is a discussion on what was done well as well as what was done badly, next to what we have learned from it, and not a discussion on who did something and why he did that instead of something else”.

The first part of the quotation is very clear on the need to implement the gained knowledge in practice, denouncing the application of gained knowledge code. The other is focused on learning from mistakes made, for which (a) appropriate learning environments established by managing learning inhibitors and facilitators need to be established that will support such learning and the mistake will be reported on, for which knowledge application is needed and will as such offer feedback information and therefore transform the information, which will serve as the input for the new loop of learning in order to prevent making the same mistake again. It denotes team psychological safety, learning from business failure, and internalized experience, utilization of past experiences, and collaborative know-how codes. The last part of the quotation emphasizes the need to learn from knowledge applications through discussions on activities done and lessons learned. On the other hand, a discussion on who is to blame and why it was done in one particular way would impede learning. For example, according to neuroleadership, such discussions evoke negative emotions that negatively affect human cognitive action. Even the knowledge would be implicated; it would not serve as a basis for a new cycle of learning if the contextual factors were not supportive to learning, denoted by team psychological safety, avoidance of conflict and politics, virtual integration and trust, (in)formal learning behaviors, learning facilitation, organizational learning culture, learning from business failure, and internalized experience, utilization of past experiences, and collaborative know-how codes.

Zupan, Halcom's idea manager, discussed the implementation of Halcom-related ideas:

QUOTATION 6 - Mr. Zupan:

“People say this is the best, a good approach, because they go back as being reborn, as they were working on things they like to work, which have fulfilled them, developed them; they have learned something, study new things, realize.”

Knowledge application (in this case, developing prototypes) serves as the source for learning, as is evident from the quotation above, which denotes the application of gained knowledge and explorative and exploitative knowledge codes. It also evokes positive emotions and empowers people to return to the regular part of their jobs.

QUOTATIONS 7 - Attendee at Si.mobil Focus Group December 7, 2012:

“TAG Business School education framework seems interesting to me as during those trainings that I attended the lecturer delivered content, a theory, and then we had to form groups and solve tasks and present the solutions to the rest of the audience; in this way we somehow tested the understanding of the content, presentation, networking. [...] What is most important to me is the chance to develop and upgrade my knowledge through practicing my job, as well as implementing newly gained knowledge in practice and, in that way, develop myself holistically. I think I would have really missed that” (Si.mobil, 2012a).

The first part of the quotation highlights the application of gained knowledge through metacognition in the official learning environment at the TAG group level, which means that the cultural dimension is also incorporated, as Si.mobil employees get to experience foreign people's perspectives and their way of solving challenges, which facilitates comparison with Si.mobil's methods of solving them. The next part is focused on the internalized experience, utilization of past experiences, and collaborative know-how code, which clearly demonstrates the need to make work meaningful.

QUOTATION 8 - Attendee at Si.mobil Focus Group, November 30, 2012:

“Through our yearly interviews, identified individual development paths, competencies system, and giving and accepting feedback, we are receiving constant opportunities for planning, and executing our mission” (Si.mobil, 2012b).

The last quotation denounces the dynamic dimension by highlighting that employees are information transformers by receiving regular feedback about their performance and applying it in their future work activities. Feedback also empowers people to contribute to the execution of the company's socially responsible mission, which is connectivity.

3.2.3 Scope of learning

As demonstrated with the provided quotations, organizations learn from and together with other organizations, enabling not only one, but rather more, organizations to learn in their collaborative learning processes. Quotation 2 clearly indicates that inter-organizational learning is a meaningful part of Halcom learning activities, as the organization also learns from and with clients, partners, and other stakeholders, providing Halcom with important competitive advantages. Similarly, as is evident from quotation 7, inter-organizational learning has an important role also in the Si.mobil case, as it represents the key developmental platform for learning from and with stakeholders inside and outside of América Móvil Group, TAG Business School, and local business partners.

No attempt was made to validate the model in a positivistic sense, but rather to highlight the model with empirical data to provide a better understanding of discussed social phenomena. Consequently, our data and research conclusions are tentative and open to new interpretations (Zhang et al., 2006). Our proposed model can be generalized to any

sector; however, in this paper, we have illustrated its usefulness in the high-tech sector only. The proposed model includes proactive, collaborative inter-organizational learning, as well as the contingency and dynamic dimension, and presents it in one conceptual model that also establishes the link between the organizational learning field and the emerging field of neuroleadership.

4 DISCUSSION

Each era brings new challenges (Van Der Vegt, Essens, Wahlström, & George, 2015), and the environment has changed dramatically since the introduction of the most acknowledged models of organizational learning; therefore, the research community needs to indicate which dimensions play important roles in contemporary organizational learning. The paper integrates partial studies, for example, (a) inter-organizational learning (Bapuji & Crossan, 2004; Beeby & Booth, 2000; Crossan et al., 1995; Crossan et al., 2011; Holmqvist, 2003; Jones & Macpherson, 2006; Mariotti, 2005; Yang et al., 2011; Zhang et al., 2006), and at the same time emphasizes its (b) contingency (Bapuji & Crossan, 2004; Crossan et al., 2011; Yang et al., 2011; Zhang et al., 2006) and (c) dynamic (Crossan et al., 1995; Crossan et al., 2011; Holmqvist, 2003; Jones & Macpherson, 2006) dimensions through investigating organizational learning literature, and presents it all in (d) an integrated, expanded model. The first identified element, learning inhibitors and facilitators, should be understood as a necessary but insufficient condition for establishing the process of organizational learning, which denotes the contingency dimension. This includes support of the appropriate information technology, organizational culture, including but not limited to regulating emotions, open communication, trust, problem solving orientation, and leadership, as well as organizational strategy, structure, and environment, which all support the successful implementation of the learning process. Several authors (Cannon & Edmondson, 2005; Chialvo & Bak, 1999; Tjosvold, Yu, & Hui, 2004) studied organizational learning from failures and emphasized the importance of such learning. Organizational culture that promotes identification and revealing of failures enables individuals and organizations to learn from their mistakes, as otherwise important opportunities are missed and learning is not a continuous process.

Different organizational learning facilitators exist (Bapuji & Crossan, 2004) that cause numerous differences in learning. For example, just as humans do not learn at the same pace (Powell, Rabbitt, & Kennedy, 2014) at the individual level, practice shows that all organizations do not learn at a constant basis or at the same pace. Fiol and Lyles (1985, p. 804) further support the contingency dimension, claiming that four contextual factors create and reinforce and are created by learning “corporate culture conducive to learning, strategy that allows flexibility, an organizational structure that allows both innovativeness and new insights, and the environment.” Nevertheless, how an organization processes information and its speed, quality, and continuity are important, and its effects constitute organizational learning. The contingencies per se are indicated in some pre-existing models, although they are not addressed sufficiently or in an appropriate proactive role. For example, in the 4I (Crossan et al., 1999) model, learning is institutionalized in its systems,

structures, strategies, and procedures. In this case, these are only the consequences, not the conditions of learning per se. Furthermore, March and Olsen (1975) suggested the need to investigate a theory of environment that was less organization centered, which is in line with adding the inter-organizational level of organizational learning. At the same time, this suggestion points to the need to include the interactive relationships with the environment and other contingency factors. Nonaka and Takeuchi (1995) emphasize organizational intention, autonomy, fluctuation and creative chaos, and redundancy, as well as requisite variety, as main contingencies; however, their SECI model is to be understood as a knowledge creation process within the knowledge management domain (Jashapara, 2011, p. 328).

The element called knowledge application and feedback information – information transformation has extreme importance in the proposed model, as it denotes the application of newly gained knowledge, which several authors support, including Örtengren (2004, p. 133), who proposed adding an additional element of organizational learning to Huber's (1991) four elements, which represent the practical usage of stored knowledge. This element enables the continuity of the process itself, as learning without any knowledge application to real life, products, solutions, processes, or artificial settings (e.g., simulations or experiments) does not allow for feedback or lessons learned, nor creative processes (Harrison & Rouse, 2015); therefore, it offers no grounds for further learning or continuity of the process. According to the information processing perspective on organizational learning, information should be translated into feedback through knowledge acquisition, information distribution, information interpretation, organizational memory, and knowledge application; this transformed information should enter into or constitute a new loop of organizational learning. Argyris and Schön (1978; in Kim, 1993, p. 38) pointed out that “learning takes place only when new knowledge is translated into different behavior that is replicable.”

Garvin (1993) also supported the need to further incorporate knowledge application into the organizational learning model. He notes that three overlapping stages of organizational learning include (a) cognitive, when members of the organization are exposed to new ideas and begin to think differently; (b) behavioral, in which employees alter their behaviors; and (c) performance improvement, when changes in behavior lead to measurable improvements in results, as performance improvement cannot be understood differently from the application of newly gained knowledge that enables feedback to improve performance. Argote and Miron-Spektor (2011) also claimed that the common denominator of existing definitions of organizational learning is a change in an organization that occurs because of the experience gained by the organization.

March (1991) emphasized the relation between an exploration of new possibilities (e.g., developing new product) and an exploitation of old certainties, (e.g., improving existing products) is important on all levels of organizational learning, which implicitly and clearly demands application of knowledge. The included dynamic dimension integrates March and Olsen's (1975) dynamic model, which incorporates individual-causing organizational actions and leads to environmental responses, which calls for knowledge

application, and the feed-forward and feedback processes relating to the four Is in Crossan et al.'s (1999) model. Nevertheless, Huber's (1991) process itself also closely looks at experiential learning (learning from direct experience) (Penger, Žnidaršič, & Dimovski, 2011) or vicarious learning (learning from others' experiences) that appear in the phase of knowledge acquisition and calls for the knowledge application phase to enable the experience in one's own or others' settings. Therefore, the learning process should and must not be understood linearly or as the end in itself, but rather as incorporating the knowledge application and feedback information – information transformation element as the basis for the next loop of organizational learning to enable the dynamic dimension based on the lessons-learned approach.

The contemporary environment has changed the learning processes in terms of content and methods, as the World Wide Web offers “instant expertise” (Peters & Snowden, 2008). Therefore, it is not enough for organizations to learn only on internal, team, and organizational levels, and hide and protect their knowledge, as the complex, dynamic, highly competitive, knowledge-intensive environment calls for forming collaborative relationships with other organizations (Fjeldstad, Snow, Miles, & Lettl, 2012; Miles, Miles, & Snow, 2005). And nevertheless, those collaborative processes include proactive learning, namely learning from and together with involved stakeholders, where several different organizations learn. It brings them important competitive advantages compared to other, not involved stakeholders.

5 IMPLICATIONS AND LIMITATIONS

5.1 Theoretical contributions

The main theoretical contribution of this paper is (a) the integration of the existing models of organizational learning into a single model and (b) adding key contingencies suggested by neuroleadership literature, emphasizing the continuity and dynamics of the process, as well as broadening the scope by adding proactive, collaborative inter-organizational learning. The proposed Diamond model of organizational learning includes a dynamic dimension that incorporates organizational learning on all levels, including the inter-organizational one, and allows for a continuous, dynamic process of organizational learning, which is shown by the outer form of the diamond that connects the five elements of the organizational learning process. This model also includes the contingency dimension by emphasizing the need to build the appropriate learning environment through managing learning inhibitors and facilitators; e.g., by practicing neuroleadership, characterized by occupying the central position of the added element and connected to all other elements. The proposed information processing model is in line with previous research and business practices of the studied illustrative examples from knowledge-intensive organizations.

As another theoretical contribution, the definition of inter-organizational learning is provided, emphasizing the group of organizations that learn in proactive, collaborative

ways, as external sources of learning are not sufficient conditions for inter-organizational learning, but are necessary. According to the definition provided, more organizations need to learn together in the long term. Learning of only one organization based on the sources of other organizations is not enough for inter-organizational learning to truly occur, e.g., through vicarious learning or grafting. When only one organization learns once from the mistake of the competitor, from benchmarking (vicarious learning), or by employing one of its competitor's key employees (grafting), this is not to be seen as inter-organizational learning, as it lacks reciprocity. Rather, it requires the mutual learning of more than one organization. This process requires cooperation or collaboration, and not just competition (Snow, 2016).

The additional theoretical contributions of this paper follow from the research findings of the developed systematic scheme. First, a more detailed inspection of the framework for the established 16 connections within the developed model points to the possibility of an under-researched area. Based on the developed systematic scheme, a poorly researched area between inter-organizational learning and emotion regulation dimensions was identified, which might offer insights into the design of other studies, as emotions and their regulation are important at all levels of organizational learning, and, as at the organizational level, might affect learning within the network of organizations.

5.2 Practical Implications

This study offers several important practical implications for knowledge-intensive organizations. First, organizations that wish to implement an organizational learning process continuously are advised to audit their organizational learning practices. By concretely auditing these processes, organizations should be able to identify their strong and weak elements and opportunities for improvement. Although the process of organizational learning must be practiced at all hierarchical levels, leaders must ensure that they practice and support the process first, as they are role models to other employees. This leads to the second important implication of the study, which concerns a focus on building an appropriate learning environment that will not impede, but support information processing and learning on all levels where leaders and the HR development department play a crucial role. Specifically, they must acknowledge that mistakes do happen, and if they cannot learn from them, they will keep repeating the same mistakes. In addition, leaders should support the building of appropriate IT environments, cultures, and climates of trust, and positive emotions where people feel safe to learn and propose new ideas and solutions based on existing and newly gained knowledge. They must also feel free to reveal and not hinder mistakes made. This is often the case in practice, as employees do not want to lose their statuses. This practice is in line with neuroleadership, which is one way to approach managerial challenges of establishing continuous organizational learning processes.

A third important implication based on neuroleadership that has managerial implications is that leaders should be aware of the fact that emotions influence the learning process at the individual and collective levels. Therefore, they should be aware of their emotions

and regulate them as well as be capable of understanding others' (e.g., followers, business partners) emotions and help them successfully regulate their emotions to not interrupt the learning process. They should incorporate good practices that will enable employees to understand how other people think as well as their reasons, which will ease their emotional regulations.

Another important implication that follows in neuroleadership is the importance of nurturing collaboration by ensuring that people feel safe as well as challenging the status quo constantly to enhance changes and enhance learning, e.g., through discussions on changes to make them more familiar to people.

The fifth important implication for practitioners and the consulting industry is the continuity of the process itself, which is based on knowledge application and feedback. When applying gained knowledge, organizations should prepare lessons learned reports, identify whether the set goals of the activity have been achieved, and identify major lessons learned and best practices. It is suggested that leaders and employees openly discuss these issues and build databases of the written reports so the next time other employees who did not participate in the post-mortem discussions will be able to act in line with the lessons learned from previous activities. This approach will enable better knowledge application and continuity of the learning process based on the gained feedback.

Nevertheless, in a turbulent, disruptive, highly competitive environment, emphasis should be given also to learning not only from, but also together collaboratively with other organizations, including suppliers, partners, customers, and other involved stakeholders. Practitioners should not understand their competitive advantages being decreased, if they learn and share it with other involved stakeholders. Rather, they should establish the process of learning from and with others searching and building on the collaborative benefits of the inter-organizational learning.

5.3 Limitations

Our paper should be read with some limitations in mind. The main limitation is its nature, as readers should be aware that the proposed Diamond model of organizational learning was developed based on an extensive literature review and was further supported with two illustrative examples from knowledge-intensive organizations. The main boundary of the proposed model is its neuroleadership framework, namely the four key domains, problem solving, emotion regulation, collaboration, and enhancement of change, that were used to limit the literature review. On the other hand, those four domains are not too narrowly defined to limit our literature review and systematic scheme too much. By no means is practicing neuroleadership the only way to build appropriate contextual factors; other means might exist, too. However, this subject exceeds the focus of this paper. This study was verified in the Slovenian business setting, which, under no circumstances, allows statistical generalization to other settings, although it does facilitate comprehension for the contemporary meaning of the organizational learning process itself.

CONCLUSION

In this paper, organizational learning was conceptualized as a dynamic, contingent, proactive, and collaborative process of information processing on all four levels. The new model proposes an integration and expansion by adding two new elements: learning inhibitors and facilitators established through practicing neuroleadership that emphasize the contingency dimension, and knowledge application and feedback information – information transformation that denotes the dynamic dimension on all four levels. The proposed advancements were suggested based on the developed systematic literature review and its coding process and was further verified within two Slovenian knowledge-intensive organizations that continuously practice organizational learning. This introduction of the integrated, expanded model of organizational learning offers the answer to the contemporary business environment. In addition, several implications of the study for the organizational learning theory and practice were identified.

The importance of organizational learning is increasing, as the global economy is becoming more complex, dynamic, and highly competitive. Learning needs to occur collaboratively within and between organizations to build and retain their competitive advantage in order to excel in a constantly changing business environment. Neuroscience findings offer valuable insights to understand the process of learning at the individual as well as social levels that is not yet incorporated into the theory and practice of the organizational learning field. It offers enormous potential also for managers and organizational designers to improve organizational learning processes on all four levels.

REFERENCES

- Adamson, B., & Walker, E. (2011). Messy collaboration: learning from a learning study. *Teaching and Teacher Education*, 27(1), 29–36.
- Akgün, A. E., Keskin, H., Byrne, J. C., & Aren, S. (2007). Emotional and learning capability and their impact on product innovativeness and firm performance. *Technovation*, 27(9), 501–513.
- Argote, L., & Miron-Spektor, E. (2011). Organizational learning: From experience to knowledge. *Organization Science*, 22(5), 1123–1137.
- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bapuji, H., & Crossan, M. (2004). From questions to answers: reviewing organizational learning research. *Management Learning*, 35(4), 397–417.
- Beeby, M., & Booth, C. (2000). Networks and inter-organizational learning: a critical review. *The Learning Organization*, 7(2), 75–88.
- Benbunan-Fich, R., & Arbaugh, J. (2006). Separating the effects of knowledge construction and group collaboration in learning outcomes of web-based courses. *Information & Management*, 43(6), 778–793.
- Breznik, L., & Lahovnik, M. (2014). Renewing the resource base in line with the dynamic capabilities view: a key to sustained competitive advantage in the IT industry. *Journal for East European Management Studies*, 19(4), 453–485.

Cannon, M. D., & Edmondson, A. C. (2005). Failing to Learn and Learning to Fail (Intelligently): How Great Organizations Put Failure to Work to Innovate and Improve. *Long Range Planning*, 38(3), 299–319. doi: 10.1016/j.lrp.2005.04.005

Chen, M. J., & Miller, D. (2015). Reconceptualizing competitive dynamics: A multidimensional framework. *Strategic Management Journal*, 36(5), 758–775.

Chialvo, D. R., & Bak, P. (1999). Learning from mistakes. *Neuroscience*, 90(4), 113–1148.

Chonko, L. B., Dubinsky, A. J., Jones, E., & Roberts, J. A. (2003). Organizational and individual learning in the sales force: an agenda for sales research. *Journal of Business Research*, 56(12), 935–946. doi: 10.1016/s0148-2963(01)00330-7

Crossan, M. M., Lane, H. W., White, R. E., & Djurfeldt, L. (1995). Organizational learning: dimensions for a theory. *The International Journal of Organizational Analysis*, 3(4), 337–360.

Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522–537.

Crossan, M. M., Maurer, C. C., & White, R. E. (2011). Reflections on the 2009 AMR Decade Award: Do We have a Theory of Organizational Learning? *Academy of Management Review*, 36(3), 446–460. doi: 10.5465/AMR.2011.61031806

Čadež, M. (2014). *Primer dobre prakse v gospodarski družbi Halcom d.d.* Ljubljana: Ekonomska fakulteta.

Černe, M., Nerstad, C., Dysvik, A., & Škerlavaj, M. (2014). What goes around comes around: Knowledge hiding, perceived motivational climate, and creativity. *Academy of Management Journal*, 57(1), 172–192.

Dillon, R. L., & Tinsley, C. H. (2008). How near-misses influence decision making under risk: A missed opportunity for learning. *Management Science*, 54(8), (articles in advances) 1–16

Dimovski, V., Penger, S., Škerlavaj, M., & Žnidaršič, J. (2005). *Učeka se organizacija: ustvarite podjetje znanja*. Ljubljana: GV založba.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350–383.

Edmondson, A. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies*, 40(6), 1419–1452.

Efklides, A. (2006). Metacognition and affect: What can metacognitive experiences tell us about the learning process? *Educational Research Review*, 1(1), 3–14.

Feingold, C. E., Cobb, M. D., Givens, R. H., Arnold, J., Joslin, S., & Keller, J. L. (2008). Student perceptions of team learning in nursing education. *The Journal of nursing education*, 47(5), 214–222.

Fiol, C. M., & Lyles, M., A. (1985). Organizational Learning. *Academy of Management Review*, 10(4), 803–813.

Fjeldstad, Ø. D., Snow, C. C., Miles, R. E., & Lettl, C. (2012). The Architecture of Collaboration. *Strategic Management Journal*, 33, 734–750.

Garvin, D. A. (1993). Building a Learning Organization. *Harvard Business Review*, 74(4), 78–91.

Gondim, S. M. G., & Mutti, C. (2011). Affections in learning situations: a study of an entrepreneurship skills development course. *Journal of Workplace Learning*, 23(3), 195–208. doi: 10.1108/13665621111117224

Google Inc. (2015). Google Scholar. Retrieved July 6, 2015, from <http://scholar.google.si/>

Halcom. (2014, 21.5.2014). E-računi: Kako iz tega narediti dober posel? *Finance*, p. 97.

Halcom. (n.a.). *About Halcom*. Retrieved July 25, 2014, from <http://www.weng.halcom.si/index.php?section=9#>

Harrison, S. H., & Rouse, E. D. (2015). An Inductive Study of Feedback Interactions over the Course of Creative Projects. *Academy of Management Journal*, 58(2), 375–404.

Hendry, C. (1996). Understanding and creating whole organizational change through learning theory. *Human Relations*, 49(5), 621–641.

Hernaus, T., Škerlavaj, M., & Dimovski, V. (2008). Relationship between organizational learning and organizational performance: The case of Croatia. *Transformations in Business Relations in CEE Countries*, 7(2), 32–48.

Holmqvist, M. (2003). A dynamic model of intra-and interorganizational learning. *Organization studies*, 24(1), 95–123.

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1), 88–115.

Hubert, M. (2010). Does neuroeconomics give new impetus to economic and consumer research? *Journal of Economic Psychology*, 31(5), 812–817. doi: 10.1016/j.joep.2010.03.009

Izuma, K. (2012). The social neuroscience of reputation. *Neuroscience Research*, 72(4), 283–288. doi: 10.1016/j.neures.2012.01.003

Janowicz-Panjaitan, M., & Noorderhaven, N. G. (2008). Formal and informal interorganizational learning within strategic alliances. *Research Policy*, 37(8), 1337–1355.

Järvenoja, H., & Järvelä, S. (2009). Emotion control in collaborative learning situations: Do students regulate emotions evoked by social challenges. *British Journal of Educational Psychology*, 79(3), 463–481.

Jashapara, A. (2003). Cognition, culture and competition: an empirical test of the learning organization. *The Learning Organization*, 10(1), 31–50.

Jashapara, A. (2011). *Knowledge management : An Integrated Approach*. Harlow, England: Pearson.

Jones, O., & Macpherson, A. (2006). Inter-organizational learning and strategic renewal in SMEs: extending the 4I framework. *Long Range Planning*, 39(2), 155–175.

Kang, S.-C., Morris, S. S., & Snell, S. A. (2007). Relational archetypes, organizational learning, and value creation: Extending the human resource architecture. *Academy of Management Review*, 32(1), 236–256.

Kim, D. H. (1993). The Link between Individual and Organizational Learning. *Sloan Management Review*, 37–50.

Kolb, D. A. (1976). Management and the learning process. *California Management Review*, 18(3), 21–31.

Kostelec, M. (2012). *Guest lecture at the course Learning and knowledge management*. Ljubljana: Ekonomska fakulteta.

Lafferty, C. L., & Alford, K. L. (2010). Neuroleadership: Sustaining Research Relevance into the 21st Century. *Advanced Management Journal*, 75(3), 32–40.

Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19(5), 461–477.

Langley, A. (2012, July). *Doing and publishing qualitative research* (Doctoral Workshop). Helsinki: EGOS 2012.

Long, S., & Newton, J. (1997). Educating the gut: socioemotional aspects of the learning organization. *Journal of Management Development*, 16(4), 284–301.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.

March, J. G., & Olsen, J. P. (1975). The uncertainty of the past: organizational learning under ambiguity*. *European Journal of Political Research*, 3(2), 147–171.

Mariotti, F. (2005). Conceptualizing inter-organizational learning: An emergent and process-based view of learning in organizational networks. *The Sixth European Conference on Organizational Knowledge, Learning, and Capabilities*, Waltham, Massachusetts, USA: Warwick University.

Miles, R. E., Miles, G., & Snow, C. C. (2005). *Collaborative entrepreneurship: How communities of networked firms use continuous innovation to create economic wealth*. Stanford, California: Stanford University Press.

Miles, R. E., Snow, C. C., & Miles, G. (2000). TheFuture.org. *Long Range Planning*, 33, 300–321.

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford university press.

Ocker, R. J., & Yaverbaum, G. J. (1999). Asynchronous computer-mediated communication versus face-to-face collaboration: Results on student learning, quality and satisfaction. *Group Decision and Negotiation*, 8(5), 427–440.

Örtenblad, A. (2004). The learning organization: towards an integrated model. *The Learning Organization*, 11(2), 129–144.

Pawlowsky, P. (2001). The treatment of organizational learning in management science. In M. Dierkers, A. Berthoin Antal, J. Child & I. Nonaka (Eds.), *Handbook of organizational learning and knowledge* (pp. 61–88). Oxford: Oxford University Press.

Penger, S., Žnidaršič, J., & Dimovski, V. (2011). Experiential learning and management education: Empirical research and implications for practice in higher education in Slovenia. *International Journal of Management & Information Systems (IJMIS)*, 15(1).

Peters, J., & Snowden, K. (2008). Video killed the radio star, but has Google killed the learning organization? *The Learning Organization*, 15(6), 449–453.

Powell, A., Rabbitt, B., & Kennedy, K. (2014). iNACOL blended learning teacher competency framework. Retrieved November 16th, 2014, from <http://files.eric.ed.gov/fulltext/ED561318.pdf>

Rock, D. (2009). *Your brain at work : strategies for overcoming distraction, regaining focus, and working smarter all day long* New York: HarperCollins.

Rock, D. (2010). Impacting Leadership with Neuroscience. *People & Strategy*, 33(4), 6–7.

Rock, D., & Schwartz, J. (2006). The neuroscience of leadership. *Strategy + Business*, 43, 70–79.

Romme, G., & Dillen, R. (1997). Mapping the Landscape of Organizational Learning. *European Management Journal*, 15(1), 68–78.

Sarin, S., & McDermott, C. (2003). The effect of team leader characteristics on learning, knowledge application, and performance of cross-functional new product development teams. *Decision Sciences*, 34(4), 707–739.

Schein, E. H. (1993). How can organizations learn faster? The challenge of entering the green room. *Sloan Management Review*, 34(2), 85–92.

Scott, J. E. (2000). Facilitating interorganizational learning with information technology. *Journal of Management Information Systems*, 17(2), 81–114.

Senge, P. M. (1993). *The fifth discipline: the art and practice of the learning organization*. London: Century Business.

Shepherd, D. A. (2003). Learning from business failure: Propositions of grief recovery for the self-employed. *Academy of Management Review*, 28(2), 318–328.

- Shrivastava, P., & Grant, J. H. (1985). Empirically Derived Models of Strategic Decision-making Processes. *Strategic Management Journal*, 6(2), 97–113.
- Simonin, B. L. (1997). The importance of collaborative know-how: An empirical test of the learning organization. *Academy of Management Journal*, 40(5), 1150–1174.
- Snow, C. C. (2016). Organizing in the Age of Competition, Cooperation, and Collaboration. *Journal of Leadership & Organizational Studies*, 23(1), 1–10.
- Škerlavaj, M., Štemberger, M. I., Škrinjar, R., & Dimovski, V. (2007). Organizational learning culture—the missing link between business process change and organizational performance. *International Journal of Production Economics*, 106(2), 346–367. doi: 10.1016/j.ijpe.2006.07.009
- Tjosvold, D., Yu, Z., & Hui, C. (2004). Team Learning from Mistakes: The Contribution of Cooperative Goals and Problem-Solving. *Journal of Management Studies*, 41(7), 1223–1245.
- Van der Bent, J., Paauwe, J., & Williams, R. (1999). Organizational learning: an exploration of organizational memory and its role in organizational change processes. *Journal of Organizational Change Management*, 12(5), 377–404.
- Van Der Vegt, G. S., Essens, P., Wahlström, M., & George, G. (2015). From the editors: Managing risk and resilience. *Academy of Management Journal*, 58(4), 971–980.
- Vorhauser-Smith, S. (2011). Integrate neuroscience into work-based learning programs: designing programs based on scientific theory. *Development and learning organizations*, 25(5), 13–16.
- Weber, B., & Weber, C. (2007). Corporate venture capital as a means of radical innovation: relational fit, social capital, and knowledge transfer. *Journal of Engineering and Technology Management*, 24(1), 11–35.
- Yang, S.-M., Ou, C.-C., Chou, C.-H., Fang, S.-C., & Fang, S.-R. (2011). Ambidexterity in Interorganizational Learning: Knowledge Exchange and Knowledge Appropriation. *Academy of Management Annual Meeting 2011*, San Antonio: Academy of Management.
- Zhang, M., Macpherson, A., & Jones, O. (2006). Conceptualizing the learning process in SMEs Improving innovation through external orientation. *International Small Business Journal*, 24(3), 299–323.
- Zupan, P. (2014). *Nagovor študentov pri predmetu Temelji managementa*. Ljubljana: Ekonomska fakulteta.