Exploring the latent variables which support SMEs to become learning organizations

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Abstract. *The purpose of this paper is to explore the latent variables which support small and medium-sized enterprises (SMEs) in becoming learning organizations. These latent variables represent abstract ideas that cannot be measured directly in practice, and they need to be explored by using different sets of other variables or indicators defined specifically for certain research of the business environment. The concept of "the learning organization" has been introduced into knowledge management literature about 30 years ago, but due to its complexity and high level of abstractness, its implementation in real life or organizations produced insufficient results for developing a well-defined model and a convincing managerial approach. However, the attractiveness of the learning organization is so appealing that researchers continue to investigate the complex mechanisms and processes supporting it. Our research is such an effort in exploring the latent variables for the small and medium-sized enterprises from the North-Easter region of Romania in their drive of becoming learning organizations. Our research is based on a comprehensive literature search and a quantitative approach supported by a survey and statistical processing of the collected data. We processed 950 valid questionnaires obtained from 147 small and medium-sized enterprises from the North-Eastern region of Romania. Statistical processing was done by using specialized software. We perform a Factor Analysis with IBM SPSS v.19, and then a Confirmatory Factor Analysis with AMOS v.18. Finally, we obtained six latent variables that support the transformation of SMEs into learning organizations.*

Keywords: knowledge management, organizational learning, learning organization, knowledge sharing, SMEs

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Introduction

The concept of the *learning organization* has been developed by Senge (1990), and then explained in more detail by Senge et al. (1994). The concept is based on a semantic extension of the *organizational learning*, a concept related to the *learning curve* and its role in the increasing efficiency and industrial work productivity (Argote & Eppele, 1990; Easterby-Smith, 1997; Eppele, Argote & Devadas, 1991). Both concepts of organizational

learning and learning organization have been created by metaphorical thinking: "It stems from an analogy, namely, the idea that a goal-oriented social structure, such as an organization, is able to learn like an organism" (Maier, Prange & von Rosenstiel, 2003, p. 14). In a social structure as a team or an organization, individual learning is amplified and then integrated in an iterative way into organizational learning, generating collaborative and, respectively, organizational knowledge (Bratianu, Agapie & Orzea, 2011; Nonaka & Takeuchi, 1995; Wellman, 2009).

However, this process of organizational learning is conditioned by some *latent factors* related to the vision and strategies of that organization and effective leadership. When these factors are absent or have no strength, the aggregation of knowledge may lead to a collective stupidity, as remarked by Albrecht (2003, p. 4): "Intelligent people, when assembled into an organization, will tend toward collective stupidity". It could be a learned stupidity, or a designed-in stupidity as a function of the managerial style and managers' intellectual power (Albrecht, 2003; Alvesson & Spicer, 2016).

Organizational learning is an emergent process that is driven by collective wisdom: "Collective wisdom emerges over time in relation to immediate needs and larger visions. It is a way of working with others that integrates what is practical, tangible, and resilient with the twists and turns that constitute the road of life. Collective wisdom invariably involves possibilities, opportunities barely glimpsed, and some yet to be imagined" (Briskin et al., 2009). Thus, managers should learn how to harness that emergent process of collective wisdom and to build organizational knowledge and a new learning and unlearning routines. By generalizing the organizational knowledge to the whole organization and creating some specific supporting mechanisms, the final result can be a learning organization. In this transformational process, SMEs have better chances of becoming learning organizations than large companies because they develop smaller inertial forces to oppose change (Bratianu, 2015; Kotter, 2008).

The learning organization is a complex adaptive system (Palmberg, 2009), and although it represents an appealing model, from a practical point of view, it represents in many situations an undelivered promise (Cavaleri, 2008; Elkjaer, 2001). The learning organization implies a totally different managerial philosophy than the industrial type developed by Frederick Taylor in the USA and Henry Fayol in France at the beginning of the last century, a philosophy that is still in practice in most of the companies in the Western world (Morgan, 1997). Significant progress has been made by developing strategic thinking and the competitive advantage driving force (Porter, 1985; Spender, 2014; Teece, 2009). By comparison, companies from the Eastern world developed more pragmatic approaches to their growth and strategic vision, based on a culture focusing on holistic thinking, harmony, and continuous quality improvement (Nonaka & Zhu, 2012; Song & Lee, 2014).

The emergence of knowledge management (Davenport & Prusak, 2000; Jashapara, 2011; Spender, 2015) and intellectual capital research (Ricceri, 2008; Stewart, 1997) lead to a reconsideration of the whole theory of organizational learning (Argote, 2013; Argyris, 1992; March, 1991) and the collaborative knowledge building, which created the conditions for the new theory of the learning organization (Senge, 1990; Senge et al., 1994).

The purpose of this paper is to explore the latent variables which support SMEs in developing into learning organizations by managing their knowledge dynamics and organizational learning (Bratianu, 2014; Bratianu & Bejinaru, 2020) efficiently. The research question is the following:

RQ: What are the latent variables which support SMEs from the North-Eastern region of Romania to become learning organizations?

The research is performed combining the qualitative analysis of the learning organizations' literature, and a survey based on a questionnaire that was addressed to the managers and key employees of the SMEs situated in the North-Eastern region of Romania. The remaining of this paper is structured as follows: o critical analysis of the literature dedicated to organizational learning and the learning organizations, the methodology used, results and discussions, conclusions, limitations, and further studies.

Literature review

Knowledge dynamics and organizational learning

Knowledge is an abstract concept, and its understanding is based on metaphorical thinking, done more or less consciously (Andriessen, 2008; Lakoff & Johnson, 1999). While in the first metaphors, *knowledge* was conceived as a static object or stock, the second generation of metaphors interpreted it as fluid flow or as stocks-and-flows (Davenport & Prusak, 2000; Nissen, 2006; Nonaka, Toyama & Hirata, 2008). However, the fluid flow metaphor contains Newtonian dynamics, which shows only a change in space and time. It cannot explain a change in its form of representation.

That limitation is removed by the new metaphor of *knowledge as energy* (Bratianu & Bejinaru, 2019). Knowledge is conceived as a spectrum composed of three fundamental fields: rational knowledge, emotional knowledge, and spiritual knowledge. Knowledge from each field can be transformed into knowledge from another field in an iterative and interactive way, like energy transformation from one form into another (Bratianu & Bejinaru, 2020). The rational knowledge field contains the knowledge that resulted from any conscious process of learning. It is an explicit form of knowledge because it is expressed by using a natural or symbolic language. The emotional knowledge field contains the wordless knowledge of our body, and it is a form of tacit knowledge. It is important in experiential learning and in developing generic skills and (Bratianu & Vatamanescu, 2017; Kahneman, 2011; Kolb, 2015). The spiritual knowledge field contains our moral, ethical, and cultural values (Schein, 2004; Zohar & Marshall, 2004).

Knowledge dynamics is a complex process that develops at the individual level and at the group and organizational levels. Nonaka and Takeuchi (1995) showed how individual tacit knowledge can be transferred within a group through socialization and how explicit knowledge can be amplified in a social context by combination. The theory of knowledge fields extend these processes and for all possible transformations between the knowledge fields. Thus, through collaboration, knowledge builds up to create at the company level organizational knowledge and intellectual capital (Argote, 2013; Bratianu, 2018; Davenport & Prusak, 2000; Edwards, 2009; Nonaka & Takeuchi, 1995). Organizational knowledge can be embedded in different structures of organization and in its procedures, regulations, and organizational culture (Argote, 2013; Starbuck, 1992). One such structure is represented by the organization's memory that can be defined as "a persistent record not dependent on a tight coupling between sender and receiver" (Stein, 1995, p. 22).

Organizational learning can be defined as that learning process that is initiated at the level of individuals and developed continuously within a social structure like a working team or the whole organization. Organizational learning is a complex process that takes place at different structural levels and in a different social context. It is a non-uniform and

non-homogeneous process with nonlinear behavior. Crossan, Lane, and White (1999) advanced a conceptual model for organizational learning that is composed of four components and develops on three levels. The four components are intuiting, interpreting, integrating, and institutionalizing, and the three levels are individual, group, and organizational. *Intuiting* is the trigger of the individual learning process that is based on filtering the previous experience and pattern recognition for finding solutions to new problems or new contexts. Intuition is an unconscious process that ignites a new idea based on the chaotic exploration of the learned experience and constructing metaphors to fit the new situation (Kahneman, 2011; Lakoff & Johnson, 1999). *Interpreting* represents the transition from the individual level to the group level facilitated by the externalization process from the well-known SECI (Socialization, Externalization, Combination, and Internalization) process developed by Nonaka (1994). Interpreting is based on a common language and knowledge maps, which lead at the group level at a shared meaning of the new idea. People can work together on their ideas only if they use the same language and a set of common values. *Integrating* spans the group process and the transition to the organizational level. Integrating is the basic mechanism of building-up collaborative knowledge (Scardamalia & Bereiter, 2003; So, Seah & Toh-Heng, 2010). *Institutionalizing* is the process of embedding knowledge into organizational structures, procedures, and regulations. It contributes to creating that part of the organizational knowledge that does not leave the company when employees are finishing their daily work leave for their home. "Although individuals may come and go, what they have learned as individuals or in groups does not necessarily leave with them. Some learning is embedded in the system, structures, strategy, routines, prescribed practices of the organization, and investment in information systems and infrastructure" (Crossan, Lane & White, 1999, p. 529).

Organizational learning is the key process of knowledge management because all the activities and tasks designed by the knowledge managers are executed through organizational learning. Thus, knowledge creation, knowledge acquisition, knowledge sharing, knowledge transfer and propagation, knowledge use, and reuse, are different forms of organizational learning. Knowledge creation is born in the mind of individuals, but it can be transformed into a useful mechanism for innovation only integrated into organizational learning. The dynamic model of knowledge creation proposed by Nonaka (1994), and then developed by Nonaka and Takeuchi (1995) and Nonaka, Toyama and Hirata (2008) explain very well how through socialization, externalization, combination, and internalization it is initiated a knowledge spiral that integrates all the three structural levels described by Crossan, Lane, and White (1999). The spiral dynamics show the intrinsic relationships between the epistemological and ontological dimensions of organizational learning. "This spiral illustrates the creation of a new concept in terms of a continual dialogue between tacit and explicit knowledge" (Nonaka, 1994, p.15).

Adopting a complexity perspective, Nonaka et al. (2014) introduce in their basic iceberg model composed of tacit and explicit knowledge the concept of *phronesis*, creating a triad having the following structure: tacit knowledge- phronesis – explicit knowledge. Phronesis brings with it the value judgment, which approaches this fractal model to the theory of the knowledge field (Bratianu & Bejinaru, 2019). Explicit knowledge represents the rational knowledge field, tacit knowledge represents the emotional knowledge field, and phronesis represents the spiritual knowledge field. Knowledge creation depends on the architecture of Ba, conceived as a shared context in motion (Nonaka, Toyama & Hirata,

2008). The new idea introduced by this complexity approach is that fractal structure is capable of self-organization: "Fractal structures can self-organize and therefore can interact with each other easily, and as a consequence, can create new knowledge" (Nonaka et al., 2014, p. 142).

As shown in the organizational knowledge dynamics model proposed by Bratianu, Agapie, and Orzea (2011), organizations are open systems to the knowledge fluxes, which means that knowledge can be transferred through the organization's interface between the internal and external business environments. Knowledge acquisition represents the flux of knowledge coming from the external business environment that is integrated into the organizational learning and used for knowledge embedding into products and services. Knowledge acquisition is more important for SMEs than for large companies because they have limited resources in focusing on knowledge creation. However, knowledge acquisition depends on the *absorptive capacity* of the company. This concept was introduced in strategic management by Cohen and Levinthal (1990), and it represents the capacity of a company to integrate the knowledge coming from the external sources into the internal process of organizational learning and to make use of that acquired knowledge. Knowledge acquisition is also related to the capacity of the company to enter business alliances and international networks (Dima, 2018; Yip & Hult, 2012). Networking represents today one of the best approaches for SMEs to share their resources with other companies and to obtain in exchange knowledge for their own production and innovation. Networking is strongly related to national cultures and the same shared values, like in China, South Korea, and Japan (Nonaka & Zhu, 2012; Pak, Chang & Park, 2009; Song & Lee, 2014).

An important driving force for organizational learning is knowledge sharing, a process based on a strong individual motivation and a social structure psychological climate (Nonaka & Takeuchi, 1995; North & Kumta, 2018; O'Dell & Hubert, 2011). Knowledge sharing contributes to the change of the knowledge distribution in an organization such that organizational entropy to be increased and innovation to be stimulated. There are many barriers to knowledge sharing, like knowledge hiding and hoarding, but they can be overcome with intelligent knowledge strategies. A specific form of knowledge sharing, used especially in the generation-layered organization, is intergenerational knowledge transfer. That is a process that involves several generations in an exchange of knowledge, and it is recommended mostly in aging societies. Universities are generation-layered organizations and can benefit from intergenerational knowledge transfer if their governance and leadership design strategies to encourage that phenomenon (Bratianu, 2014; Bratianu & Pinzaru, 2015). To overcome some of the psychological barriers in creating a culture of knowledge sharing, people created Communities of Practice (CoP), as social groups of interested individuals in sharing their knowledge to their community colleagues (Wenger, 1998; Wenger, McDermott & Snyder, 2002). SMEs are perfect social constructs to adopt the organizational behavior of such CoPs. Knowledge sharing and intergenerational knowledge exchange contribute significantly to reducing knowledge risks, especially of the knowledge loss generated by retiring employees with valuable experience and expertise (Durst & Stefan, 2013; Zieba & Durst, 2018).

Knowledge dynamics can be managed more easily in an SME than in a large company, due to its increased socialization process and small inertial forces. By extension, we can assert the same thing about organizational knowledge because the social construct

is simpler and based more on emotional knowledge than the rational one (North & Kumta, 2018; Wellman, 2009).

The learning organizations

It is necessary to underline from the very beginning that organizational learning and learning organization represent two distinct concepts. Some authors use them interchangeably, but that is misleading. As Örtenblad (2001, p. 126) remarks, "Organizational learning means processes or activities (of learning) in the organization while learning organization is a form of organization in itself". Organizational learning is a process that can be found in different forms and magnitudes in most of the organizations, while only those organizations that have the adequate vision and strategies can become in time learning organizations (Örtenblad, 2011; Smith & Tosey, 1999; Tsang, 1997).

The learning organization is a metaphor because organizations don't have cognitive competences as an individual have. However, the concept integrates a certain logic, and it helps in identifying those organizations which develop strategies for managing efficiently organizational learning and transforming it into a driving force for achieving a competitive advantage. The concept of *the learning organization* has been formulated comprehensively and explained in its complexity by Peter Senge in its seminal book *The fifth discipline: The art & practice of the learning organization* (1990). Fundamentally, a learning organization is "an organization that is continually expanding its capacity to create its future. For such an organization, it is not enough merely to survive" (Senge, 1999, p. 14). Surviving in a turbulent business environment requires continuous adaptation by developing *adaptive learning*. For an organization to become a learning organization, it is necessary to develop *generative learning*, which means "learning that enhances our capacity to create" (Senge, 1999, p. 14). SMEs have dynamic management and more flexibility in developing this new type of learning than the large companies, but they need that a well-defined managerial philosophy about knowledge as a strategic resource, and knowledge dynamics as a driving mechanism for organizational learning. Generative learning cannot be developed in an organization where the management is focused only on the short-term projects and processes and on the profit maximization through classical methods. Generative learning needs strategic thinking defined by totally different features than operational thinking. It implies developing entropic thinking, nonlinear, and probabilistic thinking modes (Bratianu, 2015).

Senge (1999) considers a learning organization a social construct where the learning infrastructure is based on five disciplines. In his perspective, discipline is essential, "a body of theory and technique that must be studied and mastered to be put into practice. A discipline is a developmental path for acquiring certain skills or competencies ... To practice a discipline is to be a lifelong learner" (Senge, 1999, pp. 10-11). For developing a learning organization, Senge (1999) considers the following disciplines essentially: personal mastery, mental models, shared vision, team learning, and system thinking.

Personal mastery reflects the spiritual dimension of learning, coming from old Eastern and Western traditions. It is related to the vision of each learner and his or her motivation for learning continually. Personal mastery makes the transition from individual learning to the organizational learning and is supported by personal efforts of analyzing new events and extracting from them a certain meaning. It means reflection and interpreting new trends and challenges. Personal vision about learning should be

convergent with the organization's vision and integrated into the collective intelligence of all the organization's members. The organization's vision is rooted in the spiritual knowledge of the founders and the value system of the leaders.

Mental models are “deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action” (Senge, 1999, p. 8). They are an integrated result of our education in the family, social community and schools, and of personal efforts to understand and explain the external world. They are composed of knowledge, intelligences and a set of spiritual values. Knowledge should be understood in its holistic framework (Bratianu & Bejinaru, 2019). Gardner (2006) explains that our mind is characterized by several intelligences, and each intelligence represents our capacity to process a specific type of information and knowledge. In a learning organization, mental models should be shared such that its members have the same view about the external environment and the adequate ways of coping with it.

A *shared vision* is a logical consequence of developing personal mastery and shared mental models. That means for all the employees to build up the same image about the future of the organization and to contribute to designing strategies to achieve some strategic objectives in that probable future. A shared vision cannot be imposed by top management. It only can be realized through participative leadership and well-inspired leaders.

Team learning is the process of organizational learning within a team. In any team, there is a basic organizational learning phenomenon that is running naturally but with rather modest results. To enhance the level of the learning output, it is needed a coherent effort induced by the team leader for managing efficiently that organizational learning.

System thinking is the fifth discipline, and it integrates all the other disciplines in a coherent and consistent learning mechanism. A system is, by definition, a complex assembly of interconnected elements that influence one each other their behavior (Jackson, 2019). The system is the whole, and it cannot be reduced to its components parts because the dynamics of the components is a nonlinear process. “By enhancing each of the other disciplines, it continually reminds us that the whole can exceed the sum of its parts” (Senge, 1999, p. 13). For a learning organization, the outcomes are richer in knowledge due to the synergy property of nonlinear systems. System thinking is strongly related to complexity management and its power of going beyond individual events, short-term objectives, and deterministic thinking (Stacey, 2001; Stacey, Griffin & Shaw, 2000). In a learning organization, there is a shift of mindset of managers and employees in seeing wholes instead of their parts and understanding that only through collaborative work, generative learning can be produced. System thinking takes advantage of creating a feedback loop between the designed outcomes and those resulting from daily operations. The feedback loop is complemented for the learning organization by a second loop that allows for changes not only in inputs but also in the reference system. Thus, a learning organization is a double-loop system (Argyris, 1992). The first loop is a feedback loop controlling the variation between the established set of characteristics for the outcomes and the real ones, while the second loop is a feed-forward loop controlling the variation between the changes in the external environment and the reference values set up for the system.

Garvin, Edmondson, and Gino (2008) designed a tool for evaluation of the development of a learning organization. That tool analyzes three building blocks necessary to co-exist for developing a learning organization: a supportive learning environment, concrete learning

processes and practices, and leadership that reinforces learning. The first block contains as a major ingredient a climate of *psychological safety*. That encourages employees to assume their mistakes and to learn from them, without the pressure of being punished. Another ingredient refers to the *appreciation of differences* and acceptance of possible conflicts of ideas. The employees should understand that natural situation and accept it in a constructive way. Also, they are encouraged to be *open to new ideas* and to *reflect* on them. The second block refers to *organizational learning processes*, which may have different structures and modes of manifestations. The third block refers to the critical role played by *leaders* who have to design the whole learning environment and making it sustainable. The three building blocks of the learning organization "reinforce one another and, to some degree overlap. Just as leadership behaviors help create and sustain supportive environments, such environments make it easier for managers and employees to execute concrete learning processes and practices smoothly and efficiently" (Garvin, Edmondson & Gino, 2008, p. 113).

Methodology

The purpose of our research was to explore the latent variables which are essential in transforming SMEs into learning organizations. The approach used in the present research integrates both qualitative and quantitative dimensions (Bryman & Bell, 2007; Jankowicz, 2005). The qualitative dimension manifested as a critical analysis of the literature search, and of extracting the main ideas for designing the survey, as a quantitative approach.

The focus of our empirical research was the SMEs from the North-Eastern (NE) region of Romania, a region with an emergent economic development. The NE region is the largest geographic, economic region of the country, with an area of 36,850 square kilometers, which represents 15.45% of the total area of the country. The NE region is composed of the following components: Bacău, Botoșani, Iași, Neamț, Suceava, and Vaslui. Based on recommendations of Field (2009), we computed a sample of 2262 questionnaires from 235 SMEs covering all counties of the NE region. We used the online procedure combined with emails for stimulating the active participation of potential respondents. Finally, we got 950 valid questionnaires, which represent 42% of the total potential sample. The respondents were representing 147 SMEs from the whole region. The empirical research data was collected in the period September-November 2019.

The questionnaire was designed in concordance with the recommendations of Field (2005) and Brace (2004). Its structure is composed of two components: the first component contains 45 items formulated as assertions or implicit questions, and the second component contains questions about the respondents' profile (i.e., age, gender, position within the organization, and working years in that organization). The first draft of the questionnaire was tested with a group of experts in quantitative research, and based on their suggestions, it has been improved. We decided to use the Lickert scale with six levels of evaluation (from 1-strongly disagree, to 6-strongly agree) in order to avoid the neutral level, which may be appealing for some respondents.

Processing the profile data we found that 28% of all respondents are in the age domain of 18-24 years old, 47% in the age domain of 25-34 years old, 28% in the age domain of 35-44 years old, 22% in the age domain of 45-54 years old, 2% in the age domain of 55-64 years old, and 1% are over 64 years old. This data shows that the majority of our respondents are young, and their openness to the new ideas induced by knowledge

management is much better than that of older employees. From the gender point of view, 78% are women, and 22% are men. From the hierarchical position within the company, the sample has the following structure: 5% top managers, 16% middle managers, 12% line managers and 67% are employees without any managerial functions. This structure offers a good representation of the organizational mindset and awareness concerning its development toward a learning organization.

The 45 items were formulated in concordance with the most significant published works analyzed (Argote, 2013; Bratianu & Bejinaru, 2019, 2020; Garvin, Edmondson & Gino, 2008; Nonaka & Takeuchi, 1995; Senge, 1999; Wellman, 2009), and presented in Table 1.

Table 1. The 45 items of the questionnaire

Item #	Items
Q01	Employees are encouraged to use a part of their time for study and improvement of their professional knowledge.
Q02	We have in our firm databases containing data and information about internal resources and current businesses.
Q03	Employees are encouraged to express their opinions, even if some of them may be in conflict with some others.
Q04	There is a constant interest in the acquisition of information and knowledge through professional journals, books, and databases.
Q05	Managers discuss and analyze the firm's problems together with the employees.
Q06	Managers organize creativity sessions like brainstorming or focus groups for harnessing new ideas in solving complex problems.
Q07	There is an interest in the acquisition of software programs for improving some processes and activities.
Q08	The firm's intranet is used to encourage organizational communications.
Q09	Managers discuss with employees about their vision of the firm's future.
Q10	There are training programs for employees to improve their competences.
Q11	Managers analyze both successful and failed projects to learn from all of them.
Q12	Managers focus on new opportunities for business.
Q13	In our firm, there is a concern for its future.
Q14	Managers stimulate the diversity of ideas coming from employees.
Q15	In our firm, there are training programs for managers.
Q16	Managers encourage intergenerational knowledge transfer.
Q17	Managers update the benchmarking databases about competitors.
Q18	All discrepancies between objectives and results are analyzed and proposed solutions for such situations.
Q19	We stimulate the development of new production methods and processes.
Q20	Employees are encouraged to consider all the problems they have as opportunities for learning.
Q21	Employees are encouraged to share their experiences and their knowledge with their colleagues.
Q22	In our firm, there is a climate of trust between all workers.
Q23	In our firm, there is a climate of transparency.
Q24	Employees are not penalized for their mistakes. They are encouraged to analyze them and to learn from them.
Q25	There are training programs for employees to update their knowledge.
Q26	Technological changes impose training programs for those who benefit from them.
Q27	Managers encourage employees to participate in the decision-making process.
Q28	Databases about suppliers are updated continuously.
Q29	Managers stimulate knowledge exchange between different departments.

Q30	Databases about clients are updated continuously.
Q31	Databases about competitors are updated continuously.
Q32	There are training programs for a professional conversion.
Q33	There are training programs for new employees to improve their integration.
Q34	Employees are encouraged to participate in discussions concerning the firm strategies.
Q35	There are periodic analyses for objectives achievements.
Q36	Managers organize databases on major issues, and employees are encouraged to participate.
Q37	There is a permanent preoccupation with creating new products and services.
Q38	Managers organize debates with experts from outside the firm to understand the new challenges of the market.
Q39	Managers provide for employees the necessary reflection time for improving their work.
Q40	Managers encourage workers to learn from the best practice of other firms.
Q41	The firm has developed a technological transfer center.
Q42	Managers perform analyses concerning the trends of the market.
Q43	Managers encourage employees to learn from their own errors.
Q44	Employees who have ideas for new products and services are supported financially by the firm.
Q45	The firm is concerned with getting intellectual property rights.

Source: Authors' own research.

Statistical analysis and discussion

The purpose of this statistical analysis is to search for correlations between variables and to find what are the most important underlying or latent variables which support organizational learning and the learning organization development. Our working hypotheses (H) are the following:

H1: The learning organization is based on specific principles that differentiate it from other organizations.

H2: The learning organization is based on specific processes that differentiate it from other organizations.

H3: The evolution of a learning organization is closely related to the implementation of knowledge management.

H4: The implementation of knowledge management requires a specific organizational framework.

For statistical analysis, we used IBM SPSS v. 19, and then AMOS v. 18. Applying the Kaiser-Meyer-Olkin (KMO) test for adequacy of the sample and Bartlett's test for sphericity, we got the results presented in Table 2. These results show that the sample is adequate, and the Factor Analysis is meaningful.

Table 2. KMO and Bartlett's test

KMO measure of sampling adequacy		0.853
Bartlett's test of sphericity	Approx. Chi-Square	24328.686
	df	990
	Sig.	0.000

Source: Authors' own research.

By analyzing the Cree Plot and the Component Matrix, we got 11 component factors to be the potential latent variables for our research. However, a deeper analysis showed that some of them have rather small values for the Cronbach's alpha coefficient, so we eliminated them from further analysis. Looking for groups of variables that are highly intercorrelated, we decided to continue with a Varimax Rotation with 6 factors, requesting

the software to perform redistribution of variables. The role of the Factor Matrix after rotation is to show what items compose each of the 6 factors and thus to discuss their common aspects (Sass, 2009). Before taking the final decision of keeping the 6 factors as they appear after the second rotation, we tested the internal consistency by applying the Cronbach's alpha test to each factor. The results are presented in Table 3.

Table 3. Reliability statistics of factors

Factors	Cronbach's alpha	Number of items	Internal consistency
Factor 1	0.861	10	Confirmed
Factor 2	0.860	11	Confirmed
Factor 3	0.842	9	Confirmed
Factor 4	0.731	6	Confirmed
Factor 5	0.749	5	Confirmed
Factor 6	0.802	4	Confirmed

Being confirmed, the 6 factors can be interpreted as the *latent variables* for the present research. Their composition is given in Table 4.

Table 4. The latent variables and their composition

Latent variables	Meanings	Composition
F1	Vision and business opportunities	Q13, Q03, Q12, Q16, Q09, Q10, Q11, Q04, Q24, Q01
F2	Knowledge structures and knowledge transfer	Q02, QA31, Q30, Q38, Q26, Q32, Q28, Q29, Q37, Q43, Q05
F3	Knowledge creation and acquisition	Q06, Q19, Q15, Q21, Q17, Q18, Q23, Q20, Q22
F4	Training programs for employees	Q33, Q25, Q07, Q34, Q39, Q14
F5	Business analyses	Q35, Q42, Q36, Q27, Q08
F6	Innovation support	Q44, Q40, Q45, Q41

Vision and business opportunities. Senge (1990) underlined in his theory the essential role of vision, manifested at the individual level as personal mastery, and at the organizational level as a leadership vision. Vision is the driving force of any change and transformation. This latent variable shows that SMEs leaders should focus on the future of their business and on identifying the opportunities for new projects (Nonaka, Toyama & Hirata, 2008). Our research confirmed that the requirement for developing a learning organization.

Knowledge structures and knowledge transfer. Knowledge management has been created to use all the intangible resources of an organization efficiently. That means to create knowledge structures by developing the organizational memory and by implementing IT data, information, and knowledge bases. Knowledge transfer, including knowledge sharing and intergenerational knowledge transfer, constitutes the driving force of organizational learning, which is the kernel mechanism of a learning organization (Nonaka & Takeuchi, 1995; Wenger, McDermott & Snyder, 2002).

Knowledge creation and acquisition. That is the driving force for innovation, and innovation is the main contributor in the SMEs strategy in achieving competitive advantage. However, because of the limited resources for SMEs to focus on knowledge creation, they should be looking for the alternative of knowledge acquisition from the external business environment, especially through networking strategies (Argote, 2013; Jashapara, 2011; Nonaka & Takeuchi, 1995).

Training programs for employees. These programs contribute to upgrading the professional knowledge of managers and employees, and to increase the organizational entropy by a better knowledge distribution (Bratianu, 2019; North & Kumta, 2018).

Business analyses. These analyses refer to the internal business environment, and to the main external stakeholders. Here, we may include business intelligence as a path for understanding the competitors' progress and intentions (Porter, 1985).

Innovation support. Innovation should be at the heart of any SME in its efforts to achieve competitive advantage on the market, and its vision of becoming a learning organization. Innovation should embrace a large spectrum of activities from designing new products and services to improve the working methods and create a dynamic organizational culture (Argote, 2013; Garvin, Edmondson & Gino, 2008).

After the Exploratory Factor Analysis, we performed the Confirmatory Factor Analysis to refine the structure of the factors and to determine the weights of influence of each variable in the research. Confirmatory Factor Analysis was run using the AMOS v.18 software. An illustration of the results obtained is presented in Figure 1. The verification of the adequacy of the factorial structure or model resulting from the Confirmatory Factor Analysis reveals that the model describes, to a large extent, the analyzed data. This conclusion is supported by the good values obtained for the indexes related to the three model adequacy measures: absolute suitability measure, incremental suitability measure, and restricted suitability measure. The first category includes the Chi-square, GFI, and RMSEA indexes. The category of incremental suitability measures includes the Tucker-Lewis Index (TLI), Normed Fit Index (NFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), and the Comparative Fit Index (CFI). Their values are presented in Table 5.

Table 5. Indexes for the model adequacy

Indexes	Abbreviations	Values
Tucker-Lewis Index	TLI	0.546
Normed Fit Index	NFI	0.553
Relative Fit Index	RFI	0.525
Comparative Fit Index	CFI	0.573
Incremental Fit Index	IFI	0.574

Analyzing the values obtained for all these indexes, we conclude that the model of the 6 latent variables is adequate for measuring the development of the learning organization. Descriptive analysis, Exploratory Factor Analysis, and Confirmatory Factor Analysis demonstrate that there is a significant impact of knowledge management on the development of a learning organization in SMEs. Thus, the statistical analysis validated all the working hypotheses we formulated in the initiating phase of the present research.

Figure 1. The latent variables interconnection resulting from the Confirmatory Factor Analysis

Conclusions, limitations and further research

A learning organization represents a relatively new organizational model that is capable of achieving a sustainable competitive advantage due to its generative learning processes. It is like an attractor for knowledge-intensive organizations, especially for SMEs as a result of their dynamics and managerial flexibility. The purpose of the present research is to analyze the capacity of SMEs from the North-Eastern developmental region of Romania for

implementing knowledge management successfully and using its processes for transforming into a learning organization.

The present research is a result of integrating a critical literature analysis with a survey based on 45 items questionnaires addressed to managers and employees working in SMEs activating in the North-Eastern economic region of Romania. We processed 950 valid questionnaires obtained from 147 SMEs, and we analyzed them statistically by using IBM SPSS v. 19 and AMOS v.18 specialized software. We performed an Exploratory Factor Analysis and a Confirmatory Factor Analysis for identifying and validating the latent variables which are capable of driving those SMEs for becoming learning organizations. The 6 latent variables revealed by our research are the following: vision and business opportunities, knowledge structures and knowledge transfer, knowledge creation and acquisition, training programs for employees, business analyses, and innovation support. Each of these latent variables is related to organizational learning and the five disciplines characteristic for the learning organizations.

The limitations of the present research are natural, operational, and normative. Natural limitations refer to the space and time of research, which has to be confined with some well-defined dimensions in order for the research to be designed and done. The operational limitations come from the fact that SMEs don't have the resources of large companies, and they cannot fully develop knowledge management. Normative limitations are related to the investigation methods, which focused mostly on quantitative research.

Further research envisions enlarging the area of research to other economic regions of the country and including also large companies. Also, qualitative research should include beyond the critical analysis of the literature, some interviews with managers and leaders with responsibilities in the domain of knowledge management.

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