The role of entrepreneurial orientation, organizational learning capability and service innovation in organizational performance

Received 11 November 2020
Revised 17 April 2021
Accepted 26 June 2021

Giancarlo Gomes
University of Blumenau, FURB, Blumenau, Brazil
Laio Oriel Seman
UNIVALI, Biguaçu, Brazil
Ana Clara Berndt
University of Blumenau, FURB, Blumenau, Brazil, and
Nadia Bogoni
University of Passo Fundo, Passo Fundo, Brazil

Abstract

Purpose – The purpose of this study is to analyze the relationships between Entrepreneurial Orientation, Organizational Learning Capability, Service Innovation and Organizational Performance. To this end, it was sought to analyze the mediating role of organizational learning capability and service innovation within entrepreneurial orientation and organizational performance relationship in knowledge-intensive organizations.

Design/methodology/approach – The sample consisted of 159 architecture and urbanism companies from Santa Catarina, Brazil. The study opted to use managers as key informants since they are the ones that have general information about the organization and are a valuable source for assessing the different variables of the organization. For data analysis, the PLS-PM algorithm (Partial Least Squares Path Modeling) was used.

Findings – Results showed that entrepreneurial orientation is a strong driver of service innovation and organizational performance. Organizational learning capability acts as a facilitator of innovation and has a positive influence on organizational performance. Another theoretical contribution of this study to organizational learning capability is the confirmation of its mediation in service innovation and organizational performance. Management needs to make its organization more proactive and creative, continually promoting new ideas. Architecture and urbanism organizations should pay more attention to maintaining and promoting entrepreneurial orientation permanently. The trend toward both proactivity and risk-taking can be an inherent advantage of these knowledge-intensive business services.

Originality/value – Few studies have explored the mediating role of organizational learning capability and service innovations in organizational performance. In particular, the combined effects of entrepreneurial orientation and organizational learning capability have been neglected by the knowledge-intensive organizations literature. The study is justified by providing a more complete view of the relationship between entrepreneurial orientation and the performance of knowledge-intensive organizations, highlighting the role of organizational learning capability and performance in service innovation.

Keywords Entrepreneurial orientation (EO), Organizational learning capability (OLC), Service innovation (SI), Organizational performance (OP), Knowledge-intensive business services (KIBS)

Paper type Research paper

Revista de Gestão
Vol. 29 No. 1, 2022
pp. 39-54
Emerald Publishing Limited
e-ISSN: 2177-8736
p-ISSN: 1809-2276
DOI 10.1108/REGE-11-2020-0103

1. Introduction

Innovation plays an essential role in fostering the competitiveness of organizations in the construction sector, particularly in architecture, urban planning and engineering organizations. Within the sector, innovation is a combination of creativity, intellectual content, technical possibilities and market demand. In addition, innovation is a complex social activity, and creating innovative design solutions requires continuous learning (Salter & Gann, 2003; Panuwatwanich & Stewart, 2012). For Kitsios & Grigoroudis (2020), identifying important elements for managers within a service innovation (SI) requires more research. The features that most often differentiate services from traditional products are intangibility, heterogeneity, inseparability and perishability (Parasuraman, Zeithaml & Berry, 1985).

SI operates as the engine of economic growth and crosses all service sectors. With a focus on innovation, service organizations have grown substantially in the last decade (Snyder, Witell, Gustafsson, Fombelle & Kristensson, 2016). Avlonitis, Papastathopoulou & Gounaris (2001) define SI as new market services, new company services, new delivery processes, service change, service line extensions and service repositioning. Although studies indicate that for a company to be innovative, it must develop organizational characteristics that incorporate a clear orientation for learning (Hult, Hurley & Knight, 2004), little is known about the mediation between Entrepreneurial Orientation (EO) and SI, based on learning capability (Nasution, Mavondo, Matanda & Ndubisi, 2011).

Learning Capability is a learning potential intrinsic to the knowledge and skills of professionals and managers in the processes/practices used in the organization, which can provide learning – such as the evaluation of strategies, results and so on. Organizational Learning Capability (OLC) is a facilitator of learning (Goh & Richards, 1997; Gonzaga, Figueiredo, Souza & Passos, 2020), and innovation (Alegre & Chiva, 2008; Gomes, Seman & De Montreuil, 2020). It is a knowledge-based capacity that involves elements that boost production processes, including the search for information and the development of new knowledge on products, processes and services (Huang & Wang, 2011; Gomes & Wojahn, 2017), resulting in practices and skills that stimulate innovation.

EO is present in organizations that strive to innovate in products or markets, take risks and act proactively in relation to their competitors (Miller, 1983; Covin & Miles, 1999). In recent years, EO has received a lot of attention, in theoretical and empirical articles that sought to understand the effect of developing processes of entrepreneurial strategy on Organizational Performance (OP) (Shan, Song & Ju, 2016) and SI. Despite its relevance for explaining how organizations develop and exploit business opportunities through entrepreneurial activities, the existing literature on EO has been criticized for neglecting OLC and knowledge creation, thus failing to explain the processes for achieving growth (Altinay, Madanoglu, De Vita, Arasli & Ekinci, 2016).

Few studies have explored the mediating role of OLC and SI in OP (Alegre & Chiva, 2013; Shan *et al.*, 2016; Gomes *et al.*, 2020). In particular, the existing literature on Knowledge-Intensive Business Services (KIBS) has neglected the combined effects of EO and OLC. Therefore, this study analyzes the relationships between EO, OLC, SI and OP, by examining the influence of EO on OLC and SI, in organizations that provide knowledge-intensive services.

This paper examines the mediating role of OLC and SI in the relationship between EO and OP, checking statistically if such mediations are relevant to achieve a better understanding of the relationships mentioned in the literature. The study provides a complete view of the relationship between EO and KIBS performance, which highlights the role of OLC and SI. A greater emphasis on EO and an increase in OLC are strategies that can enhance KIBS performance. OLC, EO and SI are evolutionary phenomena that provide an organization with continuous improvement in its results and in its ability to face challenges in turbulent environments.

We tested the hypotheses in architecture and urban planning offices in the state of Santa Catarina, Brazil, where organizations continuously face a complex and shaky environment caused by political and economic instability. Such an environment is fertile for new ideas and knowledge. These characteristics are in line with those considered central to entrepreneurial organizations. Thus, we sought a homogeneous sample of companies, in terms of size (most are small and medium-sized firms), industry (architecture and urbanization offices) and geographic location.

2. Conceptual structure and hypotheses

Naman & Slevin (1993) define entrepreneurial orientation as members' values, associated with the purpose of looking into new market opportunities and extending current areas of activities. EO explains how to put entrepreneurship into practice within organizations (Gupta, Dutta & Chen, 2014). It is also a managerial attitude, oriented toward processes of strategy development, in order to provide organizational support for management actions and decision-making (Miller, 1983; Lumpkin & Dess, 1996).

Studies emphasize EO as beneficial for organizations (Ireland & Webb, 2007; Gupta *et al.*, 2014), contributing positively to OP (Rauch, Wiklund, Lumpkin & Frese, 2009). However, Dimitratos, Lioukas & Carter (2004) and George, Wood & Khan (2001) did not find a significant relationship between EO and OP, but this may be related to organizations' external and internal variables, which affect performance, or even to the fact that EO benefits may not be observed in the short term (Madsen, 2007).

Zahra, Nielsen & Bogner (1999) recommended that researchers should start to identify all the underlying steps for determining the contribution of EO to OP. Hence, several studies adopted a holistic view in their analyses, emphasizing the relevance of the intermediate stages between EO and OP (Alegre & Chiva, 2013; Masa'deh *et al.*, 2018).

Entrepreneurial actions affect product innovations, processes and management directly (Covin & Miles, 1999; Gupta *et al.* 2014). The innovative character regards the introduction of new processes, products or ideas and is one of the most important drivers of innovation (Hult *et al.*, 2004). EO increases the proactivity and willingness of an organization to take risks and innovate and is considered one of OP antecedents (Masa'deh, Al-Henzab, Tarhini & Obeidat, 2018; Renko, Carsrud & Brännback, 2009; Zahra *et al.* 1999).

Wheelwright & Clark (1992), and later Newey & Zahra (2009), consider innovation a crucial factor in OP due to the constant evolution of the competitive environment where organizations operate. The importance of innovation for organizations' good performance, in the long run, is widely recognized and reported in the literature (Alegre & Chiva, 2013). A superior innovative performance of an organization will positively affect market and production performance (Kitsios & Grigoroudis, 2020). Consequently, innovation performance directly affects OP (Calantone, Cavusgil & Zhao, 2002; Alegre & Chiva, 2013) and is the most rigorous dependent variable estimated to assess EO and OP (Ireland, Hitt & Sirmon, 2003). Thus, we developed the following hypothesis:

H1. SI acts as a mediating variable between EO and OP.

Lumpkin and Dess (1996) describe EO as a company's strategies and actions related to the active search for new market opportunities. EO-based organizations have a more significant commitment to learning, as a way of collecting relevant information about these opportunities. Thus, organizational learning represents a competitive advantage for organizations, which results in performance gains, customer loyalty, profitability and market share (Rhee, Park & Lee, 2010; Gupta *et al.*, 2014). Organizations open to learning have a better chance of predicting trends or changes in the market, through their higher flexibility and response speed (Jiménez-Jiménez & Sanz-Valle, 2011).

A learning organization has an explicit focus on acquiring knowledge that is potentially useful for the organization (Harrison & Leitch, 2005). Learning supports company's internal self-renewal and helps to determine strategies that affect the way organizations choose, learn, refine or redefine their main business-related decisions (Covin, Green & Slevin, 2006). In organizations focused on EO, learning capability is an essential prerequisite for managers' decision-making and the standards they assume, being critical factors to determine the effect of EO on OP (Covin *et al.*, 2006; Wang, 2008).

OLC consists of resources or skills, both tangible and intangible, which allow achieving new forms of competitive advantage, while providing an organizational learning process (Alegre & Chiva, 2008). Organizational learning facilitators are experimentation, interaction with the external environment, dialogue, participative decision-making and risk propensity (Fernández-Mesa & Alegre, 2015; Gomes *et al.*, 2020). OLC allows trying new ideas for new services and superior products, which lead to business growth (Altinay *et al.*, 2016).

Because it is a dynamic process of creating, acquiring and integrating knowledge, OLC has an important contribution to developing resources that boost OP (López, Peón & Ordá; Fernández-Mesa & Alegre, 2015). Learning capability has shown beneficial effects for OP in organizations focused on EO (López *et al.*, 2005; Prieto & Revilla, 2006; Wang, 2008; Santos-Vijande, López-Sánchez & González-Mieres, 2012; Alegre & Chiva, 2013). Consequently, we formulated the second hypothesis:

H2. OLC acts as a mediating variable between EO and OP.

An organization focused on EO can create, learn and influence the environment (Garcia-Morales, Llorens-Montes & Verdu-Jover, 2006). Entrepreneurship involves creating new resources, combining existing ones, finding new ways of developing and marketing new products, reaching new markets and serving new customers (Ireland & Webb, 2007), in addition to having strategic capabilities (learning and innovation) in organizations that encourage the creation of wealth and competitive advantage (Garcia-Morales *et al.*, 2006). Thus, entrepreneurship builds and nurtures organizational learning, which, in turn, enables formulating innovation strategies (Lee & Tsai, 2005) that lead to better OP (Senge, Ross, Smith & Kleiner, 1994).

Innovation strategies are a critical success factor for a company to achieve a sustainable competitive advantage (Rhee *et al.*, 2010). From a managerial perspective, innovation is the successful implementation of creative ideas within an organization (Amabile, Conti, Coon, Lazenby & Herron, 1996). In this perspective, creativity is one of the starting points for innovation, through the combination and incorporation of knowledge into new, original and relevant products, processes and/or services (Luecke & Katz, 2003).

Hence, innovation is the introduction and implementation of new ideas and knowledge (Rhee *et al.*, 2010). The OLC process, in turn, consists of disseminating and using this knowledge within organizations. Therefore, OLC is important for the generation of innovative ideas (Argote, McEvily & Reagans, 2003). Lee & Tsai (2005) and Keskin (2006) showed that learning capability could be a link for organizations to engage in the innovation process. Therefore, considering that learning is a critical facilitator for innovation, organizations are more likely to achieve innovation when focused on EO mediated by learning capability (Hult *et al.*, 2004; Keskin, 2006; Garcia-Morales *et al.*, 2006; Liao, Fei & Liu, 2008; Rhee *et al.*, 2010).

Previous research showed that organizational learning affects innovation performance (Calantone *et al.*, 2002; Garcia-Morales *et al.*, 2006; Newey & Zahra, 2009). Wheelwright & Clark (1992) suggest that it plays a determining role in projects for the development of new products, since it allows them to adapt to different environmental factors, such as the uncertainty of customer demand, technological developments and/or increased competition.

Altinay *et al.* (2016) argue that EO has a positive impact on OLC, which, in turn, has a positive impact on innovation. Accordingly, we suggested the third hypothesis:

H3. OLC acts as a mediating variable between EO and SI.

Based on the references presented on EO, SI, OLC and OP, we proposed the conceptual model of Figure 1.

Therefore, the proposed hypotheses consider EO effects on company's performance when mediated by SI (H1), EO effects on the company's performance when mediated by OLC (H2) and EO effects on innovation performance when mediated by OLC (H3).

3. Research methods and techniques

3.1 Population and sample

According to the Brazilian Architecture and Urban Planning Council (CAU), Brazil ended 2017 with 154,264 active architects and urban planners, an increase of 8% compared to the previous year. Twenty-seven percent of these professionals were under 30 years old, while the majority (60%) were under 40 years old. The participation of women increased in 2017, representing 62.6% of the total, against 37.4% of men (CAU, 2018).

The geographical location of architecture and urban planning offices was as a criterion for sample definition, because using a sample of organizations located in a relatively homogeneous geographic, economic, political, sociocultural, technological and legal space minimizes the impact of variables that we cannot control in an empirical research (García-Morales, Jiménez-Barrionuevo & Gutiérrez-Gutiérrez, 2012). Hence, we worked with organizations located in cities of Santa Catarina State. According to CAU (2018), this state has 7,696 architects and urban planners, of which 65% are women and 35% are men. There are 1,401 registered architectural and urban planning organizations, which we defined as the research population.

We decided to use managers as key informants, since they have general information on the organization and are a valuable source for assessing different variables. Regarding the size of the firms that participate in the study, we used SEBRAE's classification (Brazilian Support Service for Micro and Small Enterprises), which considers the number of employees, instead of revenue.

Since we planned to collect all information from the same respondent (a manager), the effect of common method variance (CMV) might occur with response format, mode of collection and time. Thus, we conducted a Harman factor test, whose result showed a 44%

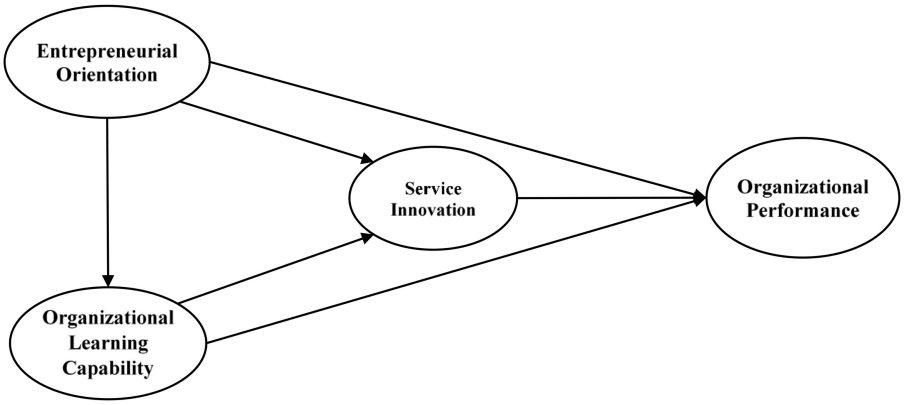

Figure 1.
Conceptual model

variation for the first factor (adequate <0.5), suggesting that the common variation would not affect our research and results (MacKenzie & Podsakoff, 2012).

3.2 Measuring variables

Khandwalla (1977) originally designed five items to measure EO. Later studies (Covin & Slevin, 1989) extended and refined the scale. The five items are present in the studies by Hult *et al.* (2004) and Hult, Ketchen & Arrfelt (2007); therefore, the scale is well established in the literature. We used a seven-point Likert scale for all items, varying from 1 (Totally Disagree) to 7 (Totally Agree).

OLC is a second-order construct composed of five dimensions. These dimensions are Experimentation, Interaction with the External Environment, Dialogue, Participative Decision-Making and Risk Propensity. The model was developed by Chiva, Alegre & Lapiedra (2007) and consisted of a seven-point Likert scale, from 1 (Totally Disagree) to 7 (Totally Agree).

SI comprised five indicators, taking into account different degrees of innovation: new service for the market, new service for the company, refurbished services, modification of existing services and extension of service line. Avlonitis *et al.* (2001) were the first to employ this approach, later adapted by Chen, Tsou & Ching (2011, 2016). Managers were asked about service innovations in the last three years, considering a seven-point Likert scale from 1 (Totally disagree) to 7 (Totally agree).

For OP, we questioned about the organization's performance in the last three years, ranging from 1 (It got worse) to 7 (It improved a lot). The OP construct was measured by four items: two for market performance (customer loyalty and sales growth) and two for financial performance (profitability and return on investment), based on the Oslo Manual (OECD, 2018) and López *et al.* (2005).

We validated the data collection instrument through the following steps: (1) translation of the questionnaire with the help of an English-speaking specialist; (2) semantic validation of the items by professionals working at KIBS companies.

3.3 Data collection

This study used managers as key informants, requesting them not to answer the questionnaire unless they could directly observe or have a good knowledge of the variables in question. The letter that introduced the questionnaire also explained the purpose of the study, asked if they wanted to receive the results and outlined the research fundamental ethical principles. They were given a period of 30 days to return the completed questionnaires, but this period was further extended to ensure a higher percentage of answers.

Initially, we received 175 questionnaires, of which 16 were removed for presenting several unanswered questions, resulting in a final sample of 159 fully answered and valid. In this sample, there were some missing data, which represented less than 5% of the total data.

As missing values are a common problem in quantitative analyses, it is necessary to handle them, since most analyses need a complete data set of data (Baraldi & Enders, 2010). Thus, we used the *missForest* imputation method, proposed by Stekhoven & Buhlmann (2011). It uses decision trees for ascribing the missing data through the *randomForest* algorithm for regression; the choice of the imputation method took into account the algorithm's nonparametric attribute.

For the statistical analysis of the sample potency, we conducted *a priori* test to check the sample's adequacy to an acceptable statistical power. The *a priori* test seeks to identify the necessary amount of observations to meet certain requirements. In this study, we sought a correlation between latent variables of at least 0.3 (Cohen, 1998), with a significance index of 5% and a statistical power of 0.9. Hence, for the desired statistical power (0.9), a sample of 112

respondents was the minimum necessary, and we concluded, *a priori*, that our sample was sufficient.

3.4 Data analysis

After data collection, the next step was to assess the measurement model. Thus, for a complete data analysis, we used the PLS-PM algorithm (Partial Least Squares Path Modeling). This choice is appropriate when the research purpose lies between testing a theory and the need to predict patterns (Hair, Hult, Ringle & Sarstedt, 2017).

4. Results

This section presents the main results of the study, starting with sample characterization. Regarding organizations' size, 63.5% of the participating offices (101 companies) were micro-organizations (up to nine employees), 25 were large firms (15.7%) and 24 small companies (15.1%). Eight managers did not answer the questionnaire, representing 5% of the total.

As for gender, 69.8% of respondents were female (111 questionnaires answered), and 30.2% were male (48 questionnaires answered), highlighting the female participation in the Architecture field in Santa Catarina. As for working time in the company, 33.3% had worked from one to three years in the same organization. The sample also revealed that working at the firm for more than ten years ranked second (21.4%), followed by less than a year (18.9%), from four to six years (16, 4%) and seven to nine years (10%).

To check data distribution, we used the Shapiro–Wilk test and found a nonnormal distribution of data. We then tested the questionnaires' adequacy to factor analysis through the Kaiser–Meyer–Olkin index (KMO) and Bartlett's Sphericity Test. The KMO index was 0.88 and the Bartlett Sphericity Test << 0.001. The KMO Index result above the recommended (0.5) meant that the questionnaire was suitable for factor analysis. In contrast, Bartlett's Sphericity test results indicated that the variables within the population were not. Thus, we could proceed with data analysis.

4.1 Reliability indicators

To begin checking the model's reliability, we tested the parameters indicated in the literature (Hair *et al.*, 2017). The first concerns the reliability indicators, where the squared outer loading (λ^2) of each indicator must be greater than 0.4 in exploratory studies. From the analysis of λ^2, we found two indicators with an index below recommended (0.4): ProRisco3 (resources for projects that involve new situations) and ProRisco4 (decision-making without having all information). We excluded these variables and ran the other tests without them.

4.2 Reliability and validation of internal consistency

Initially, we checked if the different independent variables had an exact or close linear relationship. According to Hair *et al.* (2017), the VIF (Variance Inflation Factor) result should be less than 5, for a nonsevere multicollinearity. All indexes were within the desired range, with results below 5.

The Composite Reliability (CR) of each dimension was expected to be higher than 0.6, and Cronbach's alpha (CA) higher than 0.7. Although literature considers CR a more reliable factor than CA, we used both factors in the analyses. We also used the ρA index, recently proposed by Hair *et al.* (2017), to estimate reliability using factor weights. In addition, we calculated the Average Variance Extracted (AVE), which should be above 0.5. Table 1 shows these values.

The values of CR, CA and ρA, for each of the dimensions, showed acceptable indexes in the three scales, in all constructs. AVE values for each dimension also remained above the

expected minimum of 0.5. Second-order dimensions of CR were calculated by considering the path coefficients between them and their first-order dimensions as factor loads.

4.3 Discriminant validation

For discriminant validation, we examined Fornell–Larcker criteria. To establish the discriminant validity, the square root of the AVE of each latent variable should be higher than latent variable correlations (Fornell-Larcker, 1981). The analysis was appropriate (Table 2).

4.4 Structural model results

The next step was to examine the results of the structural model. The values of R^2, adjusted R^2 and Q^2 for each of the latent variables are shown in Table 3.

We calculated the Q^2 index by cross-validating redundancy (Geisser, 1974; Stone, 1974). Both indexes for individual indicators and latent variables were within the proper range, higher than zero, highlighting the predictive power of the described model.

Table 1. Reliability of internal consistency and convergent validity

Dimension	CA	CR	ρA	AVE
OLC	0.949	0.952	0.955	0.572
Participative decision-making	0.915	0.918	0.946	0.855
Dialogue	0.856	0.869	0.905	0.707
Experimentation	0.916	0.916	0.941	0.798
Interaction with the external environment	0.754	0.756	0.859	0.669
Risk-taking	0.806	0.824	0.911	0.837
EO	0.848	0.861	0.892	0.623
SI	0.914	0.917	0.936	0.746
OP	0.899	0.901	0.93	0.77

Table 2. Discriminant validity of first-order constructs (Fornell–Larcker)

Dimension	OP	Participative	Dialogue	Experimentation	SI	Interaction	EO
OP	0.877						
Participative	0.444	0.920					
Dialogue	0.511	0.743	0.837				
Experimentation	0.517	0.676	0.778	0.894			
SI	0.578	0.433	0.449	0.525	0.863		
Interaction	0.493	0.603	0.583	0.554	0.495	0.816	
EO	0.587	0.502	0.532	0.513	0.708	0.634	0.789
Risk-taking	0.486	0.758	0.696	0.657	0.419	0.625	0.476

Table 3. R^2, adjusted R^2 and Q values

Dimension	R^2	R^2 adjusted	Q^2
OLC	0.379	0.375	0.194
Risk-taking	0.713	0.711	0.567
Participative	0.776	0.774	0.625
Dialogue	0.824	0.823	0.543
Experimentation	0.784	0.783	0.586
Interaction	0.573	0.375	0.358
SI	0.518	0.512	0.36
OP	0.448	0.437	0.319
EO	–	–	–

4.5 Structural model results – direct relationship

After analyzing the model's adjustment indexes, we tested the direct relationship of the dimensions (Table 4), which already contained their corresponding influences confirmed by BCa bootstrapping, with 5,000 replications.

To measure the size of the effect (f^2), we used Cohen's guidelines (1988), defining the value of 0.02 for small effects, 0.15 for medium effects and 0.35 for large effects. Regarding OLC construct, it shows validity of the relationships proposed in the second-order construct (OLC) with the first-order variables: Decision ($\beta = 0.881$), Dialogue ($\beta = 0.907$), Experimentation ($\beta = 0.885$), Interaction with the External Environment ($\beta = 0.757$) and Risk Propensity ($\beta = 0.845$).

4.6 Mediation tests

Mediation occurs when a third mediating variable intervenes between two other related constructs. In the proposed model, the independent variable (EO) affects the mediating variables (SI and OLC), which in turn affect the dependent variables (OP and SI); this path is called an "indirect relationship." The effect caused directly by the independent variable on the dependent variable, on the other hand, is called "direct relationship." For the mediation to be valid, the multiplication of the *p-values* related to the indirect relationship paths must be significant.

When there is significance in direct and indirect ways, the mediation is classified as a complementary mediation (Zhao, Lynch & Chen, 2010). In cases where the direct relationship does not have statistical significance, but an indirect relationship does, the mediation is total; that is, all the significant effect occurs through an indirect relationship (Zhao *et al.*, 2010; Hair *et al.*, 2017). Table 5 shows these relationships.

Path	CEOf (β)	2.50%	97.50%	*p*-values	*f*-square (f^2)
Second-order construct – OLC					
OLC → participative	0.881	0.841	0.913	0.000	3.455
OLC → dialogue	0.907	0.868	0.937	0.000	4.691
OLC → experimentation	0.885	0.827	0.926	0.000	3.630
OLC → interaction	0.757	0.674	0.827	0.000	1.341
OLC → risk taking	0.845	0.792	0.888	0.000	2.487
Direct relations test					
OLC → SI	0.173	0.036	0.328	0.017	0.039
OLC → OP	0.285	0.072	0.486	0.008	0.092
EO → OLC	0.616	0.488	0.728	0.000	0.610
EO → SI	0.601	0.407	0.759	0.000	0.463
EO → OP	0.228	0.037	0.419	0.027	0.036
SI → OP	0.265	0.115	0.399	0.000	0.062

Table 4. General index of influences by dimension

Hypothesis	Direct relationship	Direct *p*-value	Indirect relationship	Indirect *p*-value	Mediation type	Result
H1	EO → OP	0.023	EO → SI → OP	<0.001	Complementary mediation	Supported
H2	EO → OP	0.023	EO → OLC → OP	<0.001	Complementary mediation	Supported
H3	EO → SI	0.001	EO → OLC → SI	<0.001	Complementary mediation	Supported

Table 5. Direct relation and indirect mediation

In order to test this mediation analysis, we applied the procedure suggested by Hair *et al.* (2017), following the general recommendations for mediation analysis by Zhao *et al.* (2010) for bootstrapping. Through this process, we confirmed all the hypotheses. The mediation type was considered a complementary mediation, since the effects pointed in the same direction and were significant at 5% (Zhao *et al.*, 2010).

5. Result discussion

In the direct relationships test, OLC had a positive influence on organizations' innovation; thus, OLC showed a positive and significant relationship ($\beta = 0.173$) with SI, confirming previous studies that attribute to organizational learning a role of generating innovation (Alegre & Chiva, 2008; Jiménez-Jiménez & Sanz-Valle, 2011). OLC also showed a positive and significant relationship ($\beta = 0.285$) with OP, revealing its contribution to organizations' performance and confirming the previous studies by Alegre & Chiva (2008), Jiménez-Jiménez & Sanz-Valle (2011) and Gomes *et al.* (2020).

EO had a direct relationship and contributed positively and significantly to OLC ($\beta = 0.616$), to SI ($\beta = 0.601$) and to OP ($\beta = 0.228$), showing that organizations focused on EO have greater ability to create strategies and competitive advantages, positively affecting OP. This analysis strengthens Miller's study (1983). The author concluded that organizations less willing to assume an entrepreneurial behavior tend to get worser results compared to those that adopt EO.

In general, the positive results between EO and SI association can be explained by the ability and willingness of organization members to take risks and be proactive, which possibly helps introducing a new service and a new way of doing things.

SI shows a direct relationship, contributing positively and significantly to OP ($\beta = 0.265$) and confirming previous studies that mentioned innovation as one of the determining factors for organizations' performance (López *et al.*, 2005; Alegre & Chiva, 2008; Jiménez-Jiménez & Sanz-Valle, 2011). Thus, SI is an essential element for business success (Avlonitis *et al.*, 2001), retaining existing customers, attracting new ones and adding value to shareholders (Chen *et al.*, 2011).

Regarding hypotheses testing, H1 – SI acts as a mediating variable between EO and OP – was confirmed as complementary mediation, confirming previous studies by Alegre & Chiva (2013) and Gomes & Wojahn (2017), which indicate that innovation is an essential intermediate link that contributes to OP. In addition, H1 also supports the idea that organizations focused on EO have organizational characteristics that facilitate innovation performance. The result shows that significant innovation is associated with greater proactivity and greater risk acceptance.

The results also complement the study by Hult *et al.* (2004), which considers EO as one of the most important innovation factors. EO is a managerial attitude that organizations should incorporate as one of their intrinsic attributes, which facilitates learning and has positive implications for performance (Alegre & Chiva, 2013). It is important to acknowledge EO and its influence on SI, since EO allows organizations to identify and create specific resources for incorporating their products and/or services in their service delivery processes (Nasution *et al.*, 2011).

Likewise, H2 – OLC acts as a mediating variable between EO and OP – was confirmed as a complementary mediation, which validates Alegre & Chiva's (2013) study. OLC makes organizations more flexible and agile, providing better opportunities for interpreting and responding appropriately to market events and trends, resulting in the continuous improvement of OP (Gomes *et al.*, 2020; Jiménez-Jiménez & Sanz-Valle, 2011). Architecture and urban planning organizations that encourage learning among their members and take advantage of innovative ideas are more likely to achieve significant results in innovation and performance (Panuwatwanich & Stewart, 2012).

These results corroborate Li, Huang & Tsai (2009), who found that EO has a positive effect on knowledge creation processes, which, in turn, have a positive effect on OP. This implies that knowledge creation processes (OLC) serve as mediating variables between EO and OP (Rezaei & Ortt, 2018). Therefore, EO affects learning positively and broadens its scope, encouraging organizations to challenge the *status quo* and introduce flexibility and change in the way they do things (Wang, 2008).

Regarding hypothesis H3 – OLC acts as a mediating variable between EO and SI – it was also confirmed as a complementary mediation, since OLC facilitates SI. It involves elements that stimulate knowledge-based production processes, including the search for information and the development of new knowledge on products, processes and services (Huang & Wang, 2011; Gomes & Wojahn, 2017). Providing products and services that customers expect is a result of EO, which shows that OLC drives SI through EO (Altinay *et al.*, 2016).

Organizations' performance can vary within the same sector. This asymmetry occurs in organizations focused on EO and whose organizational characteristics facilitate learning (OLC) and innovation (Chiva & Alegre, 2013). OLC and EO provide important competitive advantages for architecture and urban planning organizations. According to Rhee *et al.* (2010), a continuous commitment by organizations to OLC is essential for innovation and performance improvement, in knowledge-intensive organizations based on technology and services (as is the case of KIBS).

There is evidence to support a relationship between OLC and SI. This empirical evidence implies that organizational learning affects SI. According to Liao *et al.* (2008), greater organizational learning is more significant than innovation. Hence, our study encourages organizational learning in order to increase SI.

Chiva & Alegre (2013) observe that organizations that seek EO need management actions to improve OLC dimensions, so that learning and innovation processes become more efficient. Thus, it is clear that innovation is a crucial element for organizations currently and represents the essence of their competitive advantage. Organizations with greater Learning Capability can identify the change of consumer needs and try to overcome their competitors, achieving a better OP (Altinay *et al.*, 2016).

6. Conclusion and suggestions for future research

This study analyzed the relationships between EO, OLC, SI and OP. It examined the antecedent influence of EO and the mediating role of OLC and SI in OP. Concerning SI advances in the literature, we contributed by showing that EO and OP's relationship is conditioned by or dependent on innovation. This means that innovative companies with EO are more likely to achieve a competitive advantage.

Our findings make an important contribution to the recent extension of research on SI and OP, focusing on mediators between EO and OLC. They also provide a broader framework to prove that EO strengthens OLC and SI, and consequently, OP increases. In addition, they showed that EO is a reliable driver of SI and OP. Thus, we can conclude that OLC acts as a facilitator of innovation and has a positive influence on OP.

Furthermore, the results empirically confirm that EO plays a central role in creating an innovative organization on a learning-oriented basis. Therefore, the research contributed to a theoretical extension of previous studies regarding orientation toward learning, SI and performance. There is evidence that relationships between EO, SI and OP are significant, with the direct effect being lower than the indirect effect. Consequently, this article clarifies the relationship that OLC unleashes between EO and SI on OP. In other words, to increase SI and OP, OLC must be driven by EO.

Hence, to support innovation we need to focus more on EO and OLC. The higher the levels of innovation in KIBS (architecture and urban planning organizations), the more likely they

are to increase their OP. It is appropriate to highlight the dynamic environment where KIBS operate. These environments are characterized by fast change and constant innovation. Thus, environmental dynamism can positively influence both learning and innovation.

KIBS managers must consider that entrepreneurial behavior and organizational learning make significant contributions to SI and OP. KIBS should seek to achieve entrepreneurial attributes and learn continuously. Empirical evidence showed that KIBS organizations must implement EO and follow organizational learning, thus increasing the rates of SI and OP.

Therefore, top management needs to make organizations more proactive and creative, continually encouraging new ideas. Architecture and urban planning organizations should pay more attention to keeping and promoting entrepreneurial orientation permanently. The trend toward both proactivity and risk-taking can be an intrinsic advantage of KIBS in this area.

To facilitate SI, the company must be learning-oriented. This can be done by aligning incentives for interacting with the external environment, communication, participation in decision-making, encouraging the creation and experimentation of innovative ideas, allowing (and not punishing or restricting) employees' risk-taking and using alternative approaches for developing new products and services. Top management should stimulate the organization to be more creative and proactive by always promoting new ideas. Architecture and urban planning organizations should keep and encourage entrepreneurial orientation permanently. All these actions can be KIBS advantages.

This study has some limitations. The collected data were transversal, although longitudinal data could be more useful for testing the real causality of the model. Our sample only included architecture and urban planning offices in Santa Catarina, Brazil, so future research should test the generalization of these findings.

Another direction would be to apply the model in higher technological intensity KIBS, contributing to the development of this area, given the shortage of empirical studies. Future research could use a mixed methodology, comprising qualitative and quantitative approaches, for a better triangulation of results. Moreover, control variables could be used to assess how different firm sizes would affect the hypotheses.

References

Alegre, J., & Chiva, R. (2008). Assessing the impact of organizational learning capability on product innovation performance: An empirical test. *Technovation*, (28)6, 315-326. doi: 10.1016/j.technovation.2007.09.003.

Alegre, J., & Chiva, R. (2013). Linking entrepreneurial orientation and firm performance: The role of organizational learning capability and innovation performance. *Journal of Small Business Management*, 51(4), 491-507. doi: 10.1111/jsbm.12005.

Altinay, L., Madanoglu, M., De Vita, G., Arasli, H., & Ekinci, Y. (2016). The interface between organizational learning capability, entrepreneurial orientation, and SME growth. *Journal of Small Business Management*, 54(3), 871-891. doi:10.1111/jsbm.12219.

Amabile, T., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154-1184. doi: 10.5465/256995.

Argote, L., McEvily, B., & Reagans, R..(2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science*, 49(4), 571-582. doi:10.1287/mnsc.49.4.571.14424.

Avlonitis, G.J., Papastathopoulou, P.G., & Gounaris, S.P. (2001). An empirically-based typology of product innovativeness for new financial services: Success and failure scenarios. *Journal of Product Innovation Management*, 18(5), 324-342. doi: 10.1111/1540-5885.1850324.

Baraldi, A.N., & Enders, C.K. (2010). An introduction to modern missing data analyses. *Journal of School Psychology*, 48(1), 5-37. doi: 10.1016/j.jsp.2009.10.001.

Calantone, R.J., Cavusgil, S.T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515-524. doi: 10.1016/S0019-8501(01)00203-6.

Chen, J.S., Tsou, H.T., & Ching, R.K. (2011). *Industrial Marketing Management*, 40(8), 1331-1346. doi: 10.1016/j.indmarman.2011.03.001.

Chen, K.H., Wang, C.H., Huang, S.Z., & Shen, G.C. (2016). Service innovation and new product performance: The influence of market-linking capabilities and market turbulence. *International Journal of Production Economics*, (172), 54-64, doi: 10.1016/j.ijpe.2015.11.004.

Chiva, R., Alegre, J., & Lapiedra, R. (2007). Measuring organizational learning capability among the workforce. *International Journal of Manpower*, 28(3/4), 224-242, doi:10.1108/01437720710755227.

Cohen, J. (1998). *Statistical power analysis for the behavioral sciences*, New York, NY: Department of Psychology. New York University, 2nd ed.

Conselho de Arquitetura e Urbanismo do Brasil (CAU) website. (2018). Anuário de arquitetura e urbanismo 2018. Available at: http://www.caubr.gov.br/wp-content/uploads/2018/05/ANUARIO-2018-WEB.pdf (accessed 10 Juno 2019).

Covin, J.G., & Miles, M.P. (1999). Corporate entrepreneurship and the pursuit of competitive advantage. *Entrepreneurship, Theory, and Practice*, 23(3), 47–64. doi:10.1177/104225879902300304.

Covin, J.G. & Slevin, D.P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal*, 10, 75–87. doi: 10.1002/smj.4250100107.

Covin, J.G., Green, K.M., & Slevin, D.P. (2006). Strategic process effects on the entrepreneurial orientation–sales growth rate relationship. *Entrepreneurship, Theory and Practice*, 30(1), 57–81. doi: 10.1111/j.1540-6520.2006.00110.x.

Dimitratos, P., Lioukas, S., & Carter, S. (2004). The relationship between entrepreneurship and international performance: The importance of domestic environment. *International Business Review*, 13(1), 19–41. doi: 10.1016/j.ibusrev.2003.08.001.

Fernández-Mesa, A., & Alegre, J. (2015). Entrepreneurial orientation and export intensity: Examining the interplay of organizational learning and innovation. *International Business Review*, 24(1), 148-156. doi: 10.1016/j.ibusrev.2014.07.004.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. doi: 10.2307/3151312.

Garcia-Morales, V.J., Llorens-Montes, F.J., & Verdu-Jover, A.J., (2006). Antecedents and consequences of organizational innovation and organizational learning in entrepreneurship. *Industrial Management and Data Systems*, 106(1), 21–42. doi: 10.1108/02635570610642940.

García-Morales, V.J., Jiménez-Barrionuevo, M.M., & Gutiérrez-Gutiérrez, L. (2012). Transformational leadership influence on organizational performance through organizational learning and innovation. *Journal of Business Research*, 65(7), 1040-1050.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, (61) 1, 101-107. doi: 10.2307/2334290.

George, G., Wood Jr, D.R., & Khan, R. (2001). Networking strategy of boards: Implications for small and medium-sized enterprises. *Entrepreneurship and Regional Development*, 13(3), 269–285. doi: 10.1080/08985620110058115.

Goh, S., & Richards, G. (1997). Benchmarking the learning capability of organizations. *European Management Journal*, 15(5), 575-583.

Gomes, G., & Wojahn, R. (2017). Organizational learning capability, innovation and performance: Study in small and medium-sized enterprises (SMEs). *Revista de Administração (São Paulo)*, 52(2), 163-175. doi: 10.1016/j.rausp.2016.12.003.

Gomes, G., Seman, L.O. & De Montreuil, L.J.C. (2020). Service innovation through transformational leadership, work-life balance, and organizational learning capability. *Technology Analysis & Strategic Management*. 33(4). doi: 10.1080/09537325.2020.1814953.

Gonzaga, B. S., Figueiredo, P. S., Souza, E.L.R.D.C. and Passos, F. U. (2020), Organizational learning capacity of startups in Northeast Brazil, *Revista de Gestão*, 27(3), 301-316. doi: 10.1108/REGE-11-2019-0116.

Gupta, V.K., Dutta, D.K., & Chen, X. (2014). Entrepreneurial orientation capability and firm performance under conditions of organizational learning. *Journal of Managerial Issues*, 26(2), 157–173.

Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd Ed., Sage: Thousand Oaks.

Harrison, R.T., & Leitch, C.M. (2005). Entrepreneurial learning: Researching the interface between learning and the entrepreneurial context. *Entrepreneurship Theory and Practice*, 29(4), 351–371. doi: 10.1111/j.1540-6520.2005.00089.x.

Huang, S.K., & Wang, Y.L. (2011). Entrepreneurial orientation, learning orientation, and innovation in small and medium enterprises. *Procedia-Social and Behavioral Sciences*, 24, 563-570. doi: 10.1016/j.sbspro.2011.09.004.

Hult, G.T.M., Hurley, R.F., & Knight, G.A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5), 429– 438. doi: 10.1016/j.indmarman.2003.08.015.

Hult, G.T.M., Ketchen, D.J., & Arrfelt, M. (2007). Strategic supply chain management: Improving performance through a culture of competitiveness and knowledge development. *Strategic Management Journal*, (28)10, 1035-1052. doi: 10.1002/smj.627.

Ireland, R.D., & Webb, J.W. (2007). A cross-disciplinary exploration of entrepreneurship research. *Journal of Management*, 33(6), 891–927. doi:10.1177/0149206307307643.

Ireland, R.D., Hitt, M.A., & Sirmon, D.G. (2003). A model of strategic entrepreneurship: The construct and its dimensions. *Journal of Management*, 29(6), 963-989. doi: 10.1016/S0149-2063(03)00086-2.

Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, 64(4), 408-417. doi: 10.1016/j.jbusres.2010.09.010.

Keskin, H.. (2006). Market orientation, learning orientation, and innovation capabilities in SMEs. *European Journal of Innovation Management*, 9(4), 396–417. doi: 10.1108/14601060610707849.

Khandwalla, P.N. (1977). *The Design of Organizations*, New York, NY: Harcourt Brace Jovanovich.

Kitsios, F.C., & Grigoroudis, E. (2020). Evaluating service innovation and business performance in tourism: A multicriteria decision analysis approach. *Management Decision*, 58(11), 2429-2453. doi: 10.1108/MD-09-2019-1326.

Lee, T.S., & Tsai, H.J. (2005). The effects of business operation mode on market orientation, learning orientation and innovativeness. *Industrial Management & Data Systems*, 105(3), 325-48. doi:10.1108/02635570510590147.

Li, Y.H., Huang, J.W., & Tsai, M.T. (2009). Entrepreneurial orientation and firm performance: The role of knowledge creation process. *Industrial Marketing Management*, 38(4), 440-449. doi: 10.1016/j.indmarman.2008.02.004.

Liao, S., Fei, W.C., & Liu, C.T. (2008). Relationships between knowledge inertia, organizational learning and organizational innovation. *Technovation*, 28(4), 183–195. doi:10.1016/j.technovation.2007.11.005.

López, S.P., Peón, J.M.M., & Ordáz, C.J.V. (2005). Organizational learning as a determining factor in business performance. *The Learning Organization,* 12(3), 227-245. doi: 10.1108/09696470510592494.

Luecke, R., & Katz, R. (2003). *Managing Creativity and Innovation*. Harvard Business School Press, Massachusetts, MA.

Lumpkin, G.T., & Dess, G.G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135–172. doi: 10.2307/258632.

MacKenzie, S.B., & Podsakoff, P.M. (2012). Common method bias in marketing: Causes, mechanisms, and procedural remedies. *Journal of Retailing*, 88(4), 542–555. doi: 10.1016/j.jretai.2012.08.001.

Madsen, E.L. (2007). The significance of sustained entrepreneurial orientation on performance of firms—A longitudinal analysis. *Entrepreneurship & Regional Development*, 19(2), 185–204. doi: 10.1080/08985620601136812.

Masa'deh, R., Al-Henzab, J., Tarhini, A., & Obeidat, B. (2018). The Associations among market orientation, technology orientation, entrepreneurial orientation and organizational performance. *Benchmarking: An International Journal*, 25(8), 3117-3142. doi: 10.1108/BIJ-02-2017-0024.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7), 770-791. doi: 10.1287/mnsc.29.7.770.

Naman, J.L., & Slevin, D.P. (1993). Entrepreneurship and the concept of fit: A model and empirical tests. *Strategic Management Journal*, 14(2), 137-153. doi: 10.1002/smj.4250140205.

Nasution, H.N., Mavondo, F.T., Matanda, M.J., & Ndubisi, N.O. (2011). Entrepreneurship: Its relationship with market orientation and learning orientation and as antecedents to innovation and customer value. *Industrial Marketing Management*, 40(3), 336-345. doi: 10.1016/j.indmarman.2010.08.002.

Newey, L.R., & Zahra, S.A. (2009). The evolving firm: How dynamic and operating capabilities interact to enable entrepreneurship. *British Journal of Management*, 20, S81–S100. doi: 10.1111/j.1467-8551.2008.00614.x.

OECD - Organizatório for Economic Co-operation and Development (2018). *Oslo Manual: Guidelines for Collecting, Reporting and Using Data on Innovation*, 4th ed., Paris: OECD Publishing.

Panuwatwanich, K., & Stewart, R.A. (2012). Evaluating innovation diffusion readiness among architectural and engineering design firms: Empirical evidence from Australia. *Automation in Construction,* 27, 50-59. doi: 10.1016/j.autcon.2012.05.009.

Parasuraman, A., Zeithaml, V.A., & Berry, L.L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4) 41-50. doi:10.2307/1251430.

Prieto, I.M., & Revilla, R. (2006). Assessing the impact of learning capability on business performance: Empirical evidence from Spain. *Management Learning*, 37(4), 499–523. doi: 10.1177/1350507606070222.

Rauch, A., Wiklund, J., Lumpkin, G.T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship: Theory and Practice*, 33(3), 761–780. doi:10.1111/j.1540-6520.2009.00308.x.

Renko, M., Carsrud, A., & Brännback, M. (2009). The effect of a market orientation, entrepreneurial orientation, and technological capability on innovativeness: A study of young biotechnology ventures in the United States and in Scandinavia. *Journal of Small Business Management*, 43(3), 331–369. doi: 10.1111/j.1540-627X.2009.00274.x.

Rezaei, J., & Ortt, R. (2018). Entrepreneurial orientation and firm performance: The mediating role of functional performance. *Management Research Review*, 41(7), 878-900. doi: 10.1108/MRR-03-2017-0092.

Rhee, J., Park, J., & Lee, D.H. (2010). Drivers of innovativeness and performance for innovative SMEs in South Korea: Mediation of learning orientation. *Technovation*, 30(1) 65–75. doi: 10.1016/j.technovation.2009.04.008.

Salter, A., & Gann, D. (2003). Sources of ideas for innovation in engineering design. *Research Policy*, 32(8), 1309-1324. doi: 10.1016/S0048-7333(02)00119-1.

Santos-Vijande, M.L., López-Sánchez, J.Á., & González-Mieres, C. (2012). Organizational learning, innovation, and performance in KIBS. *Journal of Management & Organization*, 18(6), 870-904. doi:10.5172/jmo.2012.18.6.870.

Senge, P., Ross, R.C., Smith, B.J., & Kleiner, A. (1994). *The fifth discipline fieldbook*. Doubleday, New York, NY.

Shan, P., Song, M., & Ju, X. (2016). Entrepreneurial orientation and performance: Is innovation speed a missing link?. *Journal of Business Research*, 69(2), 683-690. doi: 10.1016/j.jbusres.2015.08.032.

Snyder, H., Witell, L., Gustafsson, A., Fombelle, P., & Kristensson, P. (2016). Identifying categories of service innovation: A review and synthesis of the literature. *Journal of Business Research,* 69(7), 2401-2408. doi: 10.1016/j.jbusres.2016.01.009.

Stekhoven, D.J., & Bühlmann, P. (2011). MissForest—non-parametric missing value imputation for mixed-type data. *Bioinformatics*, 28(1), 112-118. doi: 10.1093/bioinformatics/btr597.

Stone, M.. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society: Series B (Methodological)*, 36(2), 111-113.

Wang, C.L. (2008). Entrepreneurial orientation, learning orientation, and firm performance. *Entrepreneurship: Theory and Practice*, 32(4), 635–657. doi: 10.1111/j.1540-6520.2008.00246.x.

Wheelwright, S.C., & Clark, L.K.B. (1992). *Revolutionizing Product Development— Quantum Leaps in Speed, Efficiency, and Quality*. New York, NY: The Free Press.

Zahra, S.A., Nielsen, A.P., & Bogner, W.C. (1999). Corporate entrepreneurship, knowledge, and competence development. *Entrepreneurship, Theory and Practice*, 23(3), 169–189. doi: 10.1177/104225879902300310.

Zhao, X., Lynch, J.G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197–206. doi:10.1086/651257.

About the authors

Giancarlo Gomes holds a doctoral degree in management and accounting from the University of Blumenau, Brazil, where he is a full professor of innovation and organizational culture (masters' and doctoral courses). His research interests include innovation management with emphasis in organizational culture, culture of innovation, innovation in products and processes. Giancarlo Gomes is the corresponding author and can be contacted at: gomes.giancarlo@gmail.com

Laio Oriel Seman holds a doctoral degree in electrical engineering from the Santa Catarina Federal University, Brazil. He has previously worked as a University Professor at the Federal University of Technology – Parana (UTFPR), Brazil. He is currently a professor in Graduate Program of Applied Computer Sciences, in the Itajaí Valley University (UNIVALI), focusing on strategies for static and dynamic optimization, along with applications in traffic control, cyber-physical systems and oil and gas production systems. His research interests include mathematical programming, embedded systems and quantitative assessment of active learning.

Ana Clara Berndt is a master's student in Administration – University of Blumenau – FURB. Her research interests include organizational culture, culture of innovation and gender.

Nadia Bogoni is a PhD student in Accounting and Administration – University of Blumenau – FURB. Adjunct Professor II of the Economic Sciences – University of Passo Fundo – Rio Grande do Sul – Brazil.

Associate editor: Rodrigo Morais-da-Silva