



RAI - Revista de Administração e
Inovação

ISSN: 1809-2039

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Universidade de São Paulo
Brasil

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RAI - Revista de Administração e Inovação, vol. 14, núm. 2, abril-junio, 2017, pp. 130-139

Universidade de São Paulo

São Paulo, Brasil

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Fostering and limiting factors of innovation in Micro and Small Enterprises

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Received 20 May 2016; accepted 2 January 2017

Available online 17 March 2017

Scientific Editor: Felipe Borini

Abstract

Literature discusses innovation factors by admitting differences between large and small firms. With this background, this research aimed to investigate the fostering and limiting factors of innovation in Micro and Small Enterprises. We adopted a categorization used for large companies to analyze these firms' reality. Research methodology had a qualitative approach and a descriptive nature, and was conducted through interviews with 20 entrepreneurs and a local innovation agent from SEBRAE (Brazilian Support Service for Micro and Small Enterprises), who acted as an innovation promoter for Micro and Small Enterprises in the city of Picos, in the Brazilian state of Piauí. Results showed that the main fostering factors were Management support and Planning of actions required for implementation. The main limiting factors were Absence of qualified personnel, Fear of innovation consequences, and Entrepreneurs and employees' conformism. Unlike other studies, the results show that the factors that affect innovation in Micro and Small Enterprises do not differ significantly from those in larger companies.

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Keywords: Innovation; Micro and Small Enterprises (MSE); Fostering and limiting factors of innovation

Introduction

Innovation is an important instrument for companies to increase their competitiveness, and thus survive in a scenario of changing and increasingly demanding markets (Benito-Hernandez, Platero-Jaime, & Rodriguez-Duarte, 2012; Kastrati, 2015; Mazolla, 2013; Xie & Zeng, 2013). Considered a driving force of economic development (Schumpeter, 1988), innovation has aroused interest among academics and executives from different fields of knowledge, and became the subject of research and events that address the sustainable competitiveness of organizations (Santos, 2011; Xie & Zeng, 2013).

The large number of internal and external factors that influence the innovative process makes it difficult to assess this phenomenon (OECD, 2005; Souza & Bruno-Faria, 2013). By acknowledging the importance of the subject (Kastrati, 2015; Silveira, 2013), a stream of the literature has addressed these factors. But most of the research has focused on large companies (Benito-Hernandez et al., 2012; Silva & Dacorso, 2013), with Micro and Small Enterprises (MSE) coming next.

These small firms constitute the economic basis of many nations, by fostering innovation, employment, competitiveness and global economic growth (Taneja, Pryor, & Hayek, 2016). In Brazil, SME exceed 9 million businesses (98% of total companies), accounting for more than half of the formal jobs and a significant portion of national GDP (SEBRAE, 2015).

Considering the relevance of MSE and of innovation factors for their survival and competitiveness (Pereira, Grapeggia, Emmendoerfer, & Três, 2009; Santos, 2011), this paper aimed to investigate the fostering and limiting factors of innovation in MSE.

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Peer Review under the responsibility of Departamento de Administração, Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo – FEA/USP.

<http://dx.doi.org/10.1016/j.rai.2017.03.007>

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Literature (Mazolla, 2013; Silva & Dacorso, 2013) suggests that innovation in MSE has different attributes than in larger companies. When studying the Spanish reality, Benito-Hernandez et al. (2012) proved the variation of factors between companies of different sizes.

The research conducted by Souza and Bruno-Faria (2013) approached Brazilian larger companies and defined 21 factors that influenced innovation, of which nine were fostering factors and 12 were limiting factors. The present study has adopted this categorization, but was not limited to it, in order to investigate the reality of MSE. To do so, a descriptive research of qualitative approach was carried out, through interviews with 20 MSE considered of low technological intensity – low-tech (Zawislak, Zen, Fracasso, Reichert, & Pufal, 2013), and one local innovation agent (SEBRAE's ALI program) who acted in these firms.

Considering its novelty, the study contributes academically to the understanding of the fostering and limiting factors of innovation in MSE, and affects the business and social contexts, since it can guide the actions of companies' managers and of experts on innovation public policies toward the economic growth of the country.

Next section addresses the theoretical framework, followed by the methodology. In sequence, we present the results and their analysis and discussion, followed by the conclusion, which includes the research limitations and suggestions for future studies.

Theoretical framework

This section presents the concepts of innovation, its influence factors and the specificities of innovation in MSE.

Innovation

Starting from the initial conception by Schumpeter (1988), the Organization for Economic Co-operation and Development [OECD] (2005) defined innovation as the implementation of a new or significantly improved product (good or service), or a process, or a new marketing method, or a new organizational method in business practices, in the organization of the workplace or in external relations. Hence, there is product, process, marketing or organizational innovation.

Innovation is something that emerges from a new idea that must be necessarily put into practice, and should be capable of generating value for the company or for the stakeholders (Schumpeter, 1988). For organizations, innovation enables greater competitiveness and the possibility of business survival (Benito-Hernandez et al., 2012; Kastrati, 2015; OECD, 2005; Pereira et al., 2009; Schumpeter, 1988).

In the process of implementing innovations there is always the possibility of uncertainty, especially due to the presence of several individual, technological and cultural factors (Benito-Hernandez et al., 2012; Tidd, Bessant, & Pavitt, 2008), as presented below.

Fostering and limiting factors of innovation

Mazolla (2013) observed that the effectiveness of the innovation process is a management issue, and it should be carried out in a systemic way, involving all the company's departments. The task of managing innovation relates to the establishment of organizational routines and to the investigation of environmental factors that affect the success of the innovative process (Tidd et al., 2008).

Factors related to innovation are dynamic in nature, which makes it difficult to accurately measure and understand their impacts. Fostering factors can stimulate the implementation of new ideas and practices, while limiting factors can stop innovation, delay it or raise its costs (OECD, 2005; Souza & Bruno-Faria, 2013).

Many papers (Alencar, 1995; Benito-Hernandez et al., 2012; Bruno-Faria & Alencar, 1996; Dorow, Medeiros, Souza, & Dandolini, 2013; Gomes & Lapolli, 2014; Kastrati, 2015; Mazolla, 2013; Sousa, 2006; Souza & Bruno-Faria, 2013; Taneja et al., 2016) discuss several factors that affect innovation in the organization's external or internal environment. This research adopted as the main reference the factors described by Souza and Bruno-Faria (2013), who categorized nine fostering and twelve limiting factors in the innovation process. Despite emerging from larger companies, we consider the classification adequate for smaller companies.

- (a) Fostering factor 1 (F1) – Management support: support from top and middle management. It is represented in the literature by the following expressions: 'freedom and autonomy for employees'; 'encouragement of creativity and production of ideas'; 'support from executives or heads of departments'; 'tolerance to risk and error'; 'adequate financial incentives'; 'presence of creative leaders'; 'control through goals and results over standards'; 'leadership'; 'innovation as organizational goal' (Alencar, 1995; Bruno-Faria & Alencar, 1996; Dorow et al., 2013; Gomes & Lapolli, 2014; Parolin, Vasconcellos, & Bordignon, 2006).
- (b) F2 – Support of working groups and collaborators: Receptivity, motivation and involvement of employees regarding innovation. It is described in the literature as: 'employees' participation'; 'support from workgroup and colleagues'; 'motivation and personal involvement'; 'acceptance of new ideas'; 'cooperation'; 'interaction between actors'; 'knowledge sharing' (Alencar, 1995; Bruno-Faria & Alencar, 1996; Dorow et al., 2013; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (c) F3 – Diversity of competencies in the group responsible for innovation: Different qualifications, experiences and skills required for innovation. This factor is addressed in the literature as: 'acceptance of differences'; 'favorable organizational climate'; 'use of ideas'; 'synergy'; 'innovation approach under multiple perspectives' (Dorow et al., 2013; Gomes & Lapolli, 2014; Parolin et al., 2006; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (d) F4 – Disclosure of information on innovation: Use of efficient communication channels to implement innovations.

- The literature addresses this factor as: ‘skilled communication between managers and staff’; ‘knowledge of organizational strategy’; ‘transparency and visibility of the innovation process’ (Dorow et al., 2013; Pacagnella & Porto, 2012; Parolin et al., 2006; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (e) F5 – Strategies for incorporating innovation into organizational routines: Actions and strategies that foster the incorporation of innovations. In the literature this factor is mentioned as: ‘lean, flexible and unbureaucratic organizational structure’; ‘adequate physical environment’; ‘adaptation solution for innovation’; ‘orientation and training’ (Alencar, 1995; Pacagnella & Porto, 2012; Silveira, 2013; Souza & Bruno-Faria, 2013; Taneja et al., 2016; Tidd et al., 2008).
- (f) F6 – Participation of external collaborators: Cooperation of professionals from outside the organization in the implementation process, which involves: ‘seizing external sources of technology’; ‘recruitment of new professionals’; ‘consultancy hiring’; ‘valorization of open innovation’; ‘partnerships’; ‘presence of masters and doctors in projects’ (Chesbrough, 2003; Pacagnella & Porto, 2012; Parolin et al., 2006; Silva & Dacorso, 2013; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (g) F7 – Planning of actions required for implementation: Detailed planning of the actions to be developed, as well as the necessary tests and adjustments for implementing the innovation. The literature mentions it as: ‘availability of financial, material and technological resources’; ‘provision of time for generating ideas’; ‘information survey’; ‘identification of best practices’; ‘experiments to test new ideas and practices’ (Bruno-Faria & Alencar, 1996; Dorow et al., 2013; Kastrati, 2015; Pacagnella & Porto, 2012; Souza & Bruno-Faria, 2013).
- (h) F8 – Acknowledgment of the value and need of innovation: Importance given to the implementation of new ideas and practices. Literature cites it as: ‘structure of trust and cooperation’; ‘challenging tasks and assignments’; ‘learning for individuals and organization’; ‘search for support’; ‘overcoming of challenges’ (Alencar, 1995; Sousa, 2006; Souza & Bruno-Faria, 2013; Tidd et al., 2008).
- (i) F9 – Systemic view of innovation and of interactions between organizational units: Development of a global view in the company’s units. This factor involves: ‘cohesive organizational strategy’; ‘systemic approach to innovation’; ‘involvement of all the company’s departments’; ‘standardization of procedures’ (Mazolla, 2013; Parolin et al., 2006; Sousa, 2006; Souza & Bruno-Faria, 2013).
- The fostering factors presented above were described by Souza and Bruno-Faria (2013) and discussed by several authors who deal with innovation. Next, the 12 limiting factors of the innovative process are presented.
- (a) Limiting factor 1 (L1) – Disbelief toward innovation: Sensation of distrust and discredit regarding innovation, associated to the following aspects: ‘doubts as to innovation success’; ‘lack of motivation, involvement and self-confidence’; ‘absence of incentives for radical innovations’; ‘suspicion and skepticism toward innovation’ (Alencar, 1995; Parolin et al., 2006; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (b) L2 – Difficulties in organizational interaction: Obstacles to joint action of organizational units, caused by: Inadequate physical environment; Difficulty in communication; Rigid and bureaucratic organizational structure; Difficulty of cooperation between areas; Great amount of rules and procedures; Rigidity in interpersonal treatment (Bruno-Faria & Alencar, 1996; Gomes & Lapolli, 2014; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (c) L3 – Excess of activities and time shortage: a short time to perform the necessary tasks for implementing innovations, which includes: ‘time pressure due to excess of activities’; ‘delays in implementation’; ‘lack of time for interaction, training and exchange of ideas’ (Bruno-Faria & Alencar, 1996; Dorow et al., 2013; Sousa, 2006; Souza & Bruno-Faria, 2013).
- (d) L4 – Lack of support from top management: Attitudes and behaviors of executives denoting disagreement, disapproval or omission in the implementation of innovations. They comprise: ‘chiefs resistant to new ideas’; ‘lack of freedom and autonomy’; ‘discouraging salaries’; ‘intolerance to error’; ‘reluctance to allocate needed resources’; ‘lack of commitment to innovation’ (Bruno-Faria & Alencar, 1996; Gomes & Lapolli, 2014; Souza & Bruno-Faria, 2013).
- (e) L5 – Limitation of people: Lack of knowledge, skills and attitudes required for innovation. Among these are: ‘lack of training’; ‘fragility in interpersonal relationships’; ‘reluctance to share knowledge’; ‘individualism’; ‘lack of skilled labor’; ‘lack of managerial knowledge’; ‘insufficient number of employees’; ‘little diversity of qualifications and capabilities’; ‘difficulties for teamwork’ (Bruno-Faria & Alencar, 1996; Demirbas, Hussain, & Matlay, 2011; Dorow et al., 2013; Kastrati, 2015; Petter & Andrade, 2011; Souza & Bruno-Faria, 2013; Xie & Zeng, 2013).
- (f) L6 – Limitation of financial resources: Difficulties to access and to effectively use financial resources needed for innovation, such as: ‘lack of resources and low capacity to get credit’ (Bozic & Rajh, 2016; Demirbas et al., 2011; Löfqvist, 2012; Parolin et al., 2006; Petter & Andrade, 2011; Souza & Bruno-Faria, 2013; Xie & Zeng, 2013).
- (g) L7 – Limitation of technological resources: Difficulty to access and effectively use technologies necessary for innovation. Included in this category are: ‘lack or difficulty to access technology’; ‘low technological capacity’; ‘absence of technical equipment and computer systems’ (Kastrati, 2015; Petter & Andrade, 2011; Sousa, 2006; Souza & Bruno-Faria, 2013; Xie & Zeng, 2013).
- (h) L8 – Obstacles originating in the external environment: Barriers arising from aspects outside the organization and not controllable by its managers and employees. These external limiting factors are mentioned in the literature as: ‘competition with other firms’; ‘political system’; ‘government regulations’; ‘cultural values’; ‘relations with suppliers’;

‘technological progress’; ‘trade union issues’; ‘regulatory and tax constraints’ (Alencar, 1995; Bozic & Rajh, 2016; Löfqvist, 2012; Sousa, 2006; Souza & Bruno-Faria, 2013).

- (i) L9 – Priority for core or short-term activities: Emphasis on core activities that are more related to the organization’s business or short-term activities. These include: ‘absence of R&D activities’; ‘Taylorist-Fordist paradigm’; ‘precariousness of the physical environment’; ‘lack of planning and maturation’; ‘repetitive and unchallenging tasks’; ‘difficulty to develop long-term risk projects’ (Bruno-Faria & Alencar, 1996; Silva & Dacorso, 2013; Souza & Bruno-Faria, 2013).
- (j) L10 – Fear of innovation consequences: Fear triggered by the uncertainties of the innovation process, such as: ‘low propensity to take risks’; ‘rejection of new ideas’; ‘feeling of insecurity’; ‘high complexity, risk and uncertainty’; ‘possibility of cuts and layoffs’; ‘fear of the unknown’; ‘fear of making mistakes’; ‘fear of investment in innovation’ (Dorow et al., 2013; Mazolla, 2013; Souza & Bruno-Faria, 2013).
- (k) L11 – Resistance to innovation due to loss of power: Actions, attitudes and behaviors of employees or groups that feel threatened by changes in the power structures. This factor includes: ‘intolerance to ambiguity’; ‘envy and jealousy’; ‘dispute for power and authoritarianism’; ‘changes in hierarchical structures’; ‘loss of prestige, political power and decision-making power’ (Alencar, 1995; Parolin et al., 2006; Souza & Bruno-Faria, 2013).
- (l) L12 – Resistance to innovation due to conformism: Actions, attitudes and behaviors that fight innovation, showing difficulties to accept new ideas and practices, among which are: ‘habit, formalism and attachment to tradition’; ‘dogmatism’; ‘resistance to change’; ‘reluctance to adopt new ideas’; ‘risk aversion’; ‘preservation of *status quo*’ (Alencar, 1995; Dorow et al., 2013; Gomes & Lapolli, 2014; Sousa, 2006; Souza & Bruno-Faria, 2013).

It is important, for a change of paradigm, to investigate the presence of these factors and how they act in MSE, since many firms remain in a dangerous comfort zone, resigned to making meager profits, with a short-sighted view of the innovation benefits (Silveira, 2013).

Innovation in micro and small firms

Despite the fact that most of the literature considers MSE as firms that have great difficulties to innovate, there are features that stimulate the adoption of innovations (Benito-Hernandez et al., 2012; Tidd et al., 2008; Xie & Zeng, 2013).

Silva and Dacorso (2013) presented three theoretical propositions in order to define innovation patterns in MSE. The first argues that these companies constantly innovate through their processes, either by modifications, improvements or replacement by other processes. The second states that these are the firms that benefit most from open innovation (Chesbrough, 2003), by using the ideas of customers, suppliers and competitors as their main sources of knowledge. The third proposition suggests that these external sources of knowledge act as

substitutes for internal R&D, filling out internal deficiencies at low cost.

The lean and simplified organizational structure typical of MSE is a positive factor, in comparison to bigger companies with a large number of hierarchical levels and strict managerial controls. The structure of the small business speeds up communication and decision-making, facilitates receptivity to novelties and the coordination of activities, and increases the commitment of the work teams (Benito-Hernandez et al., 2012; Silveira, 2013; Tidd et al., 2008).

For MSE, innovation does not require large investments, and its practice is not necessarily linked to a great discovery, but rather to the use of creativity and commitment to innovation (Costa & Olave, 2014; OECD, 2005; Silveira, 2013).

Technological deficiencies and the difficulty to develop long-term risk projects are pointed as one of the barriers to innovation in MSE (Benito-Hernandez et al., 2012; Tidd et al., 2008). The result is the low frequency of radical innovations, being the incremental ones more common in these firms, which develop from small changes for solving day-to-day problems (Silveira, 2013). Costa and Olave (2014) observed that innovation in MSE occurs in a timely, occasional and reactive way and in many cases this process is merely the adoption of external innovations, such as the acquisition of new machinery and equipment.

Other fragilities of MSE in the innovation process are: distance from research institutions, low investment in R&D, lack of innovation planning and maturation, learning difficulties in the innovative process and low availability of financial resources (Benito-Hernandez et al., 2012; Silveira, 2013).

Empirical studies about this reality are relevant to understand more deeply the peculiarities of MSE, especially the factors that affect innovation (OECD, 2005; Pereira et al., 2009).

Methodology

The research had a qualitative approach. It describes the attributes of a given phenomenon – innovation factors – of a given population – MSE of the city of Picos, in the Brazilian state of Piauí (Vergara, 2007).

Secondary data were obtained from published articles and books, and primary data were collected through face-to-face interviews. The sample of the empirical research was composed of companies that participated in the ALI (Local Agents of Innovation) Program in that city.

ALI is a national program, developed by the Brazilian Support Service for MSE [SEBRAE], in partnership with the National Council for Scientific and Technological Development [CNPq], and seeks to foster business innovation as a factor of differentiation and competitiveness’ enhancement for MSE (Santos, 2011).

The intention of conducting a census survey with the 22 companies that took part in the program was frustrated by the impossibility of interviewing two of these companies. Thus, interviews were carried out in 20 companies (E1 to E20), of 7 business sectors considered low-tech, that is, of low technological intensity (Zawislak et al., 2013). The respondents were the entrepreneurs themselves (or their agents, in two firms).

Table 1
Categorization for content analysis.

Category	Subcategory
Fostering factors	Management support (F1)
	Support of working groups and collaborators (F2)
	Diversity of competencies in the group responsible for innovation (F3)
	Disclosure of information on innovation (F4)
	Strategies for incorporating innovation into organizational routines (F5)
	Participation of external collaborators (F6)
	Planning of actions required for implementation (F7)
	Acknowledgment of the value and need of innovation (F8)
	Systemic view of innovation and of interactions between organizational units (F9)
Limiting factors	Disbelief toward innovation (L1)
	Difficulties of organizational interaction (L2)
	Excess of activities and time shortage (L3)
	Lack of support from top management (L4)
	Limitation of people (L5)
	Limitation of financial resources (L6)
	Limitation of technological resources (L7)
	Obstacles originating in the external environment (L8)
	Priority for core or short-term activities (L9)
	Fear of innovation consequences (L10)
	Resistance to innovation due to loss of power (L11)
	Resistance to innovation due to conformism (L12)

Note: Adapted from Souza and Bruno-Faria (2013).

Besides the interviews with the entrepreneurs, an additional one was conducted with an ALI agent, who acted as an innovation promoter in these companies. This external vision contributed significantly to the research, by confirming or contradicting their opinions.

Considering the scope of the study, we decided to conduct the interviews using a semi-structured script of subjective questions, which were complemented by new ones that emerged during the research.

The interviews had an average duration of 30 min, sufficient to reach the level of theoretical saturation. They were recorded and transcribed before being categorized, analyzed and interpreted, according to Bardin's (2011) content analysis. Table 1 shows the categories and subcategories adopted in the study.

Analysis and discussion of results

In this section we present the results, separated in two subsections: the fostering factors and the limiting factors of innovation.

Fostering factors of innovation in Picos' MSE

Table 2 presents the frequency of citations of the fostering factors by the respondents.

From the data shown in Table 1, all the categorized fostering factors were mentioned by the interviewees. Highlights for F1 – Management support (23 verbalizations) and F7 – Planning of actions needed for implementation (17 citations). The

main speeches and comments for each category are presented in sequence.

F1 (Management support) is critical for the implementation of organizational changes. Not by chance, it was the most cited category, identified in 23 statements from 11 respondents.

Among the researched firms, with few exceptions, the managers are the entrepreneurs themselves, and are responsible for the innovations. This can be observed in the following statement:

The entrepreneur must be willing to change, to study, to research, to qualify himself ... to find what is new, even if it's more expensive. Also he has to plan, to have schedules ... it depends more on him (E18).

Evidence shows that a considerable share of entrepreneurs had some resistance toward innovation (Dorow et al., 2013). But in recognizing the possible benefits of the process of change (Souza & Bruno-Faria, 2013) they seemed prone to innovate, as shown in the interview with the ALI agent:

Despite the initial resistance, when entrepreneurs implemented changes in general they acknowledged their value. [...] Every innovation they made, however simple, they liked it, and then we celebrated, and they ended up by recognizing that it had been something good for them (ALI agent).

Other elements mentioned in the interviews were the propensity to invest and take risks (Alencar, 1995; Gomes & Lapolli, 2014); willpower to roll up their sleeves and do hard work (Dorow et al., 2013); and valuation of employee's participation in the innovation process (Dorow et al., 2013; Parolin et al., 2006).

Regarding F2 (Support of working groups and collaborators), 11 verbalizations were extracted, which highlight the employees as important elements in the innovation process, as in this passage: *There was participation of the employees. At my suggestion, we sought to involve as many of them as possible in the discussions with the boss (ALI agent).*

F3 (Diversity of competencies in the group) had only two records in the interviews, both emphasizing the importance and need of qualification of the people involved in the innovation process.

For innovation to happen, people need to be more qualified, more skilled (E8).

One of the most important things for innovation is the qualification of employees, whether inside or outside the company. Experience is better than theory (E20).

The predominance of incremental and small-scale innovations (Costa & Olave, 2014; Silveira, 2013) does not require the formation of large and specialized groups in MSE. For this reason, we may consider that this factor has little importance for these firms.

F4 (Disclosure of information) is presented in the literature as a crucial element for innovation, and can be proved by the following excerpt from an interview: *"Innovation depends a lot on information. It is important that everyone is well-informed in order to speak the same language"*(E7).

Table 2
Verbalization frequency regarding the fostering factors of innovation.

Fostering factors	Number of verbalizations	Number of interviewees that verbalized	Percentage
F1. Management support	23	11	25.27%
F2. Support of working groups and collaborators	11	10	12.09%
F3. Diversity of competencies in the group responsible for innovation	2	2	2.20%
F4. Disclosure of information on innovation	4	3	4.40%
F5. Strategies for incorporating innovation into organizational routines	11	11	12.09%
F6. Participation of external collaborators	7	7	7.69%
F7. Planning of actions required for implementation	17	17	19.68%
F8. Acknowledgment of the value and need of innovation	9	9	9.89%
F9. Systemic view of innovation and of interactions between organizational units	7	7	7.69%
Total	91	77	100%

However, only four respondents mentioned this factor. The perception is that communication is not a relevant problem for MSE (Silveira, 2013). The presence of few employees makes the exchange of information easy, and it is usually carried out informally (Benito-Hernandez et al., 2012). The ALI agent has positively addressed this factor: *“There are few communication problems, but participation in the ALI program improved it, especially through bulletin boards and periodic meetings with the members of the company”*.

As to F5 (Strategies for incorporating innovation into organizational routines), 11 statements from seven interviewees were registered, showing firms' concern with the transition from the old to the new organizational reality. The main actions reported relate to the willingness to exhibit the benefits of innovation (Parolin et al., 2006), to encourage employees to participate in courses, as well as in-company guidance and capacity building (Dorow et al., 2013; Tidd et al., 2008), as highlighted in the following passages:

We started to count on the nutritionist's guidance, and she made several changes [...]. She trains very well the kitchen staff and even the service staff (E5).

The firm seeks to invest in training employees who are more interested, who do things with pleasure (E11).

F6 (Participation of external collaborators) was identified in seven statements from seven interviewees. As can be observed in the passages below, there are examples of hiring nutritionists as consultants, as well as hiring experienced professionals for the staff, who were capable of improving the company's activity

We recently hired a nutritionist to support production. For example, to provide training and guidance to deal with special cases such as the diabetic (E2).

I was able to offer new products since the hiring of an experienced person, with qualification in salty snacks (E20).

The partnership with SEBRAE in the ALI Program is a demonstration that all companies in the study sought and took advantage of its guidelines to innovate in their businesses.

Regarding F7 (Planning of actions required for implementation), 17 verbalizations from 11 interviewees were recorded, showing the concern with planning the actions, especially when

it comes to innovations that require greater efforts (adaptation or resource allocation). We highlight the following excerpts:

We usually plan the changes. Especially when they involve more financial resources, we think better, but without a very strict schedule (E4).

To create new flavors, we make mixtures, tests, experiments, until we get to the point where we consider it good (E9).

Despite the various statements, most of the planned situations are of a tactical or operational level, with little strategic and long-term concern (Tidd et al., 2008). The main actions are experimentation and research to launch new products, and benchmarking against other companies.

As to F8 (Acknowledgment of the value and need of innovation), nine verbalizations from six respondents were identified. We list some examples:

I realized that I needed to innovate in marketing. We changed the logo and standardized for several objects [...]. It brought a new look to the company (E2).

Today we have to renovate our company. The customer is more informed, more demanding ... and if we do not keep up with this evolution, these innovations, we are left behind (E13).

Some statements reveal entrepreneurs' level of confidence regarding the return of the investments made in improvements at their companies. For the ALI agent, this confidence and willingness to innovate *“increased as small changes began to impact customers' perception and even the company's revenue.”*

The speeches show that these effects were seen as improvements in layout (Parolin et al., 2006), service and marketing (OECD, 2005), reduction of costs and increase of revenue and profits (OECD, 2005; Schumpeter, 1988).

F9 (Systemic view of innovation and of interactions between organizational units) was cited by seven respondents in seven speeches, from which the following were extracted:

When there is a new proposal, we try to involve everyone in the company (E2).

It's usually me (the owner) who brings the news in terms of flavors and new products, then my mother develops them and

Table 3

Verbalization frequency regarding the limiting factors of innovation.

Limiting factors	Number of verbalizations	Number of interviewees that verbalized	Percentage
L1. Disbelief toward innovation	7	5	7.60%
L2. Difficulties of organizational interaction	5	5	5.43%
L3. Excess of activities and time shortage	8	7	8.69%
L4. Lack of support from top management	4	4	4.34%
L5. Limitation of people	16	11	17.39%
L6. Limitation of financial resources	7	7	7.60%
L7. Limitation of technological resources	3	3	2.17%
L8. Obstacles originating in the external environment	4	3	4.34%
L9. Priority for core or short-term activities	7	6	7.60%
L10. Fear of innovation consequences	16	11	17.39%
L11. Resistance to innovation due to loss of power	0	0	0%
L12. Resistance to innovation due to conformism	16	10	17.39%
Total	93	72	100%

passes on to the production line staff. In the end everybody gets involved in some way (E9).

Innovation seen through a systemic lens is extremely important (Mazolla, 2013), especially in larger institutions, where there is great capillarity between organizational units or functional areas. The fact that none of the studied companies has a branch or a well-structured departmentalization reduces the level of complexity of organizational interaction. Therefore, the speeches show a concern for a global interaction, but we only find this practice between individuals or groups and not in a formal and departmentalized structure.

Limiting factors of innovation in Picos' MSE

This section presents the limiting factors of innovation, starting with Table 3, which shows the frequency of each category.

The most cited limiting factors were L5 – Limitation of people, L10 – Fear of innovation consequences, and L12 – Resistance to innovation due to conformism, each with 16 references. Only category L11 was not mentioned.

Some interviewees indicated receptivity and motivation of people regarding innovation in fostering factors F1 and F2. Despite this, seven speeches from five interviewees representing L1 (Disbelief toward innovation) were identified, mainly associated with resistance to novelties (Dorow et al., 2013), lack of suggestions, lack of initiative and involvement, and pessimism (Alencar, 1995), as can be seen in the following passages:

The main barrier to innovation is people's pessimism, their lack of enthusiasm or persistence, and of entrepreneurial vision (E1).

Resistance is the worst of them [barriers to innovation] ... There is almost always resistance to innovations. Then we have to persuade the employees (E2).

These barriers to innovation are mainly ascribed to the firms' staff, and deserve two comments. The first is that respondents are part of the top management, as owners or managers. Hence, there is the possibility of making more criticisms of the employees and

less of themselves. The second is that, despite mentioning the employees' initial aversion to innovation, many admit that, over time, there is a reduction in resistance, favoring the process of adaptation and learning.

L2 (Difficulties of organizational interaction) was identified in five statements of five respondents, of which the following are highlighted:

I am aware of the benefits that innovations can bring to the company, but not everyone here has this concern about innovating (E6).

I investigate to know more details, and still try to improve. But I suffer resistance from my husband who doesn't like new things (E17).

Given the lean organizational structure, typical of MSE (Silveira, 2013), organizational interaction is not seen through branches or departments, but through people (or small groups). The five entrepreneurs reported the lack of a uniform view regarding innovation projects, either among employees or among owners.

Three female entrepreneurs complained about the exaggerated resistance of their husbands toward innovations. The hypothesis that the female gender is more prone to innovate was evidenced by the ALI agent's statement:

The funny thing is that women are more open and more enthusiastic about novelties. When we tried to implement something or gave any suggestion, men were more resistant. Women were more receptive.

Regarding L3 (Excess of activities and time shortage), eight records were made by seven interviewees, which reveal the factor "time" as one of the major problems of MSE, according to the following passages:

As we were running too much, at a very intense pace, we decided to reduce the size of the business in order to relieve our burden [two owners] (E7).

It's an excellent program [ALI]! But I could not implement all stages, mainly for lack of time (E14).

The overload of activities (Bruno-Faria & Alencar, 1996), the lack of strategic planning and of transparency in the distribution of tasks and responsibilities (Parolin et al., 2006) adds to the small number of employees, which generates a cycle that harms routine activities, and especially the medium and long-term projects such as the implementation of innovations.

L4 (Lack of support from top management) was registered in four statements of four respondents, revealing the lack of involvement or interest (Bruno-Faria & Alencar, 1996) in the implementation of innovations in MSE, as shown below:

She [owner] is not much interested in innovating (E2).

I know that innovation is important. I received all guidance from the [ALI] program and did not innovate because I didn't want to, [...] really, a lack of interest (E6).

For the ALI agent, those who have undertaken in order to seize an opportunity were more enthusiastic about the novelties, and had the innovator's attributes described by Schumpeter (1988). *"But those who undertook out of need, because they had no other activity, were not so enthusiastic about promoting changes"*.

L5 (Limitation of people) is undoubtedly one of the main barriers to innovation in MSE. Sixteen speeches were recorded in 11 interviews, about human resources deficiencies. The highlights were:

For the new project [...] the team we have today has no technical skill (E14).

The lack of qualified people is the big problem in our sector. The few that we have do not get involved, they resist working (E19).

The available workforce is often inexperienced or unqualified (Petter & Andrade, 2011) to fulfill the vacancies, as informed by the ALI agent: *"[Employees] They were generally unskilled [...]. They had never attended courses, not even a lecture, for example"*.

The major problems identified in the interviews were: workers' disinterest and conformism (Gomes & Lapolli, 2014; Parolin et al., 2006), especially among the younger; absence of institutions in the region to qualify professionals; low productivity; entrepreneurs' low managerial capacity (Benito-Hernandez et al., 2012; Petter & Andrade, 2011).

L6 (Limitation of financial resources) was pointed as a great barrier to innovation by seven of the entrepreneurs, who understand that only with money it is possible to innovate, as in the excerpt: *The main barrier is the financial question. To innovate one has to spend and have the courage to spend* (E13).

Contrary to this majority view, some firms managed to spend little and innovate with results, as entrepreneur E11 revealed: *"you can innovate in some things even by investing almost nothing. For example, a simple bulletin board that we put here has solved countless problems"*. Instead, ALI agent said:

There were only one or two cases that received big investments, but what prevailed were small changes in day-to-day business [...]. Almost everyone claimed that to innovate it

takes a lot of money, but in the end practically all firms have managed to innovate.

Thus, there are incremental and small-scale innovations that provide significant gains for companies and can be implemented without the need for large investments (Silva & Dacorso, 2013). This type of innovation is what prevails in the context of MSE (Costa & Olave, 2014; Silveira, 2013) that need improvement and use their creativity as a substitute for spending.

Although it has been registered in only three interviews, L7 (Limitation of technological resources) is a reality in small enterprises, as can be seen in the passages below:

I have a plan to insert a computerized service system, but I find it difficult, especially with the waiters. When we talk about it they already jump away, starting with the manager (laughs) (E1).

We started a project to computerize and control the stock, but nobody here has much practice with computers, so we ended up leaving it aside (E7).

This lack of knowledge and technological skills (Petter & Andrade, 2011) affects both employees and the entrepreneurs themselves, and hinders the managerial capacity of companies. For the ALI agent, *"most of them carry out their communication and operational controls by traditional means, without the aid of computational tools."*

As for L8 (Obstacles originating in the external environment), we have identified four speeches from three respondents. Situations such as bureaucracy imposed by banks and public institutions (Alencar, 1995), difficulties with commercial partners (Souza & Bruno-Faria, 2013) and the number of requirements of tax and labor legislations (Alencar, 1995; Bozic & Rajh, 2016) were mentioned about this factor. The main verbalizations were:

We have already looked for financing from banks to buy new machines, but bureaucracy strongly hinders the process (E2).

For the small businessman it is a struggle, a lot of taxes, a lot of labor collection. These make it very difficult (E6).

The ALI agent brought an important topic regarding external problems. For him, there is little government incentive for innovation, especially for smaller companies; in periods of economic recession entrepreneurs reduce their confidence and investment, inhibiting innovative actions of greater relevance.

Another aspect that deserves attention relates to competition, because *"when the entrepreneur found out that his competitors were doing this or that, he was encouraged to do the same or innovate in something."* Thus, the action of competitors (Alencar, 1995) can also be seen as a catalyst for business innovation.

L9 (Priority for core or short-term activities) was recorded in six interviews with seven verbalizations, showing that long-term planning (Souza & Bruno-Faria, 2013) is not among the main concerns of small entrepreneurs, as the following passage shows:

Changes occur on an occasional basis, without much planning or long-term preparation. [...] Usually we focus on what

has a quick return and doesn't cost much . . . and we do it little by little (E3).

The ALI agent stresses that the predominant innovations in these companies consist of small changes (Costa & Olave, 2014; Silveira, 2013), which were implemented spontaneously, without a systematic monitoring by the entrepreneurs and without targeting big objectives. *"It was something that happened without them realizing it was an evolution"*.

As discussed in F7, long-term planning is typically done for innovations that demand larger investments. However, some important decisions, which can compromise the financial structure of the company, are taken by impulse:

Usually we make the changes without much thought, without much planning. For example, I decided to buy the dishwasher all of a sudden, when I got angry with an employee. Next day I bought it. And it was expensive! (E16).

L10 (Fear of innovation consequences) was mentioned by 11 respondents in 16 verbalizations, appearing as one of the biggest barriers to innovation. The main speeches show the conservatism as to financial investments in innovation (Petter & Andrade, 2011), resistance to novelties (Dorow et al., 2013) and the feeling that innovations do not affect demand, as shown below:

Modernization can sometimes scare some of the more traditional customers. [. . .] I'm afraid to make big investments that can become a shot in the foot (E4).

Most of the entrepreneurs were resistant to changes. It was hard even to make them join the program. [. . .] There were situations in which I clearly noted that the employee was afraid . . . afraid of losing his job; afraid to have more tasks. . . (ALI agent).

During the interviews, several entrepreneurs reported on employees' resistance to innovation. And we have also the statement by the ALI agent claiming that he faced a lot of resistance from entrepreneurs, even to join SEBRAE's free program to foster innovation.

Regarding L11 (Resistance to innovation due to loss of power), there was no statement considering it a barrier to innovation. This can be explained by the rigid structure of power, distinguished by the entrepreneur's or one of his faithful relative's command, leaving no room for change and, therefore, for a threat against power relations.

L12 (Resistance to innovation due to conformism) was another leader in citations, being identified in 16 speeches from 10 respondents. Examples:

When there is a new proposal, we seek to involve everyone in the company, but not all really embrace it. They [collaborators] are afraid of change and do not want to leave their comfort zone (E2).

Our company did not grasp the opportunity to innovate. In general, we innovate very little, for lack of courage and initiative of our own (E13).

Conformism was reported by entrepreneurs and the ALI agent on several occasions, with emphasis on the lack of involvement with innovations (Parolin et al., 2006) and the absence of pleasure in learning, thus creating a situation of paralysis that puts them in a comfort zone and inhibits innovative actions.

Some entrepreneurs recognize that this feeling is not exclusive to employees, and they assume their conservative positioning (Gomes & Lapolli, 2014), by making no efforts for improvements. One of them, claiming to be comfortable with the current situation, made his intention very clear through this popular saying: *"If it ain't broke, don't fix it"*.

Conclusion

The companies surveyed in this research reflect the economic scenario of the region, basically comprised of family MSE of low technological intensity, with centralized management by the owner. Despite their low level of management capacity, entrepreneurs are primarily responsible for the implementation of innovations, mostly incremental.

In spite of the absence of innovative culture, MSE that took part in the ALI Program have made organizational changes that provided administrative advances, such as cost reduction, increase in product supply, increase in revenue, and improved communication and motivation. Therefore, innovation is perceived as a viable alternative for MSE's economic growth.

Regarding the main purpose of the study, to investigate the fostering and limiting factors of innovation in MSE, the results showed that, contrary to other studies on the subject, there is consonance of the factors that influence innovation in large and small companies.

Among the fostering factors, the most important is F1 – Management support – which, due to the simplified structure of MSE, is always linked to the entrepreneur. Despite their initial fear and reluctance, entrepreneurs who have implemented innovations achieved satisfactory returns, which changed their perception and valued the permanence of the innovative process. The other highlight is F7 – Planning of actions required for implementation –, mainly represented by the launch of products and adoption of practices used in the market (benchmarking). This planning is more focused on short and medium-term actions, especially for innovations that require more material and human resources.

As to the limiting factors, the most significant were L5 – Limitation of people –, identified by the lack of qualified professionals to take up positions in the company; L10 – Fear of innovation consequences –, associated with entrepreneurs and employees' conservatism regarding financial investments, besides reluctance and insecurity with innovations; and L12 – Resistance to innovation due to conformism –, which reflects the lack of involvement and pleasure with the innovations, in favor of keeping their comfort zone and the *status quo*.

The environment conducive to innovation in MSE must count on the commitment and capacity of entrepreneurs and employees in order to value, plan and carry out new ideas and practices. The association of these factors was able to reduce the resistance

to changes and to stimulate the implementation of successful innovations in those companies.

It is noteworthy that MSE do not worry so much about factors that are considered important in the literature, such as communication, diversity of skills and good use of technological resources.

Interviews revealed three other issues that stand out: (a) entrepreneurs who undertake out of need are less motivated and more resistant to innovate; (b) in family businesses, women are more prone to innovations than men; (c) the business paradigm ‘innovating is expensive’ was demystified, since many SME have innovated with little spending and using creativity as their main raw material.

The research has some implications. From the theoretical point of view, it helps to better understand and increases the debate on the convergence or divergence of innovation factors in companies of different sizes, besides bringing some insights (like those in the previous paragraph), which open up new research paths. From a practical standpoint, it suggests courses that managers focused on innovation should follow to achieve competitiveness and sustainability in their businesses. From the social standpoint, the study of these factors may drive public policies to encourage innovation and contribute to the reduction of companies’ mortality, economic growth and generation of employment and income.

The limitations of the study are: (a) the research extent: only companies that participated in the ALI Program; (b) Interviews restricted to top managers: an exclusive view from entrepreneurs or their representatives.

We present some suggestions for future studies: (a) expansion in the number of firms and comparison with other scenarios, such as technology-based companies; (b) research with the employees; (c) studies comparing the influence of gender (male vs. female) on the implementation of innovations; and (d) investigations that focus on the actions developed by the ALI Program to improve innovation in MSE.

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