WOMEN ENTREPRENEURS IN A MALE-DOMINATED ENVIRONMENT: LEADING HIGH-TECH STARTUPS IN BRAZIL

MULHERES EMPREENDEDORAS EM UM AMBIENTE DOMINADO POR HOMENS: LIDERANDO STARTUPS DE ALTA TECNOLOGIA NO BRASIL

Vânia Maria Jorge Nassif [1]
Marcos Hashimoto [2]
Cândido Borges [3]
Tales Andreassi [4]

Abstract: This article aims to identify the strategies that women entrepreneurs employ in the field of technology and innovation to develop their businesses in a male-dominated context. It is a longitudinal qualitative study of an exploratory nature based on a semi-structured interview. Seven women entrepreneurs who are leading new ventures in a business incubator participated to this study. The results showed that, even in a place traditionally occupied by men, the women feel confident about developing their projects. Family and close friends exert influence on both success and failure of their projects and, even when facing obstacles and difficulties in their daily lives, the women enjoy what they do. The strategies more personal and behavioral related showed more positive results than cognitive or technical related. The paper fills a gap in the literature by exploring the strategies that women entrepreneurs employ to develop their high-tech startups in a male-dominated environment.

Keywords: Women. Entrepreneur. Gender. Startups. Strategy. Incubator.

Resumo: Este artigo tem como objetivo identificar as estratégias empregadas pelas mulheres empreendedoras para desenvolver seus negócios tecnológicos e inovadores em um contexto dominado por homens. Trata-se de um estudo qualitativo longitudinal, de caráter exploratório, com base em entrevista semiestruturada. Sete mulheres que empreenderam em uma incubadora de empresas participaram deste estudo. Os resultados mostraram que, mesmo em um local tradicionalmente ocupado por homens, as mulheres se sentem confiantes em desenvolver seus projetos. A família e os amigos exercem influência tanto no sucesso quanto no fracasso de seus projetos e, mesmo diante de obstáculos e dificuldades no dia a dia, as mulheres desfrutam do que fazem. As estratégias do tipo pessoal ou comportamental mostraram resultados mais positivos do que as cognitivas ou técnicas. O artigo contribui para a literatura ao mostrar as estratégias que as mulheres empreendedoras empregam para desenvolver suas startups de alta tecnologia em um ambiente dominado por homens.

Palavras-chave: Mulheres. Empreendedor. Gênero. Startups. Estratégia. Incubadora.

[1] PhD in Management and Entrepreneurship, Universidade Nove de Julho. Lattes: http://lattes.cnpq.br/6936403740310206. ORCID: /0000-0003-3601-2831. E-mail: vania.nassif@gmail.com

[2] PhD in Management, Millikin University - School of Business. Lattes: http://lattes.cnpq.br/8655211749535634. ORCID: 0000-0002-9072-7160. E-mail: hashi.marcos@gmail.com

[3] PhD in Management, Universidade Federal de Goiás. Lattes: http://lattes.cnpq.br/4803860037213326. ORCID: 0000-0003-3362-4074. E-mail: candidoborges@ufg.br

[4] PhD in Management, Fudação Getulio Vargas. Lattes: http://lattes.cnpq.br/8678896439466385. ORCID: 0000-0002-7636-3014. E-mail: tandreassi@gmail.com

Introduction

The creation of businesses is one of the factors that bring prosperity to a nation. Through this activity, innovation takes place and opportunities, jobs and wealth are created. The fact that people are willing to take risks and engage in a business venture is one of the pillars of economic development. Foray and Hargreaves (2002) explain that the production of knowledge and innovation and, consequently, the generation of wealth help to explain development, especially economic development (JULIEN, 2010). Although economic development in different locations has benefitted from the activities of women entrepreneurs (BRUIN *et al.*, 2007; MACHADO *et al.* 2013), we can still see the obstacles and barriers they have to face, especially when they seek to gain a place in the labor market or in sectors that are mostly male dominated, such as technology and engineering (ZAPATA-HUAMANÍ et al., 2019).

In Brazil, until recently, the vast majority of women were housewives. It was difficult for them to enter to the labor market. They were submitted to embarrassing situations and discriminated against if they sought to support themselves. The struggle to win their rights and a position in the labor market is relatively recent, although the unfair situation persists, and the solutions remain remote. In spite of this, the *Global Entrepreneurship Monitor* (GEM, 2017) revealed that in Brazil there is actually a higher percentage of women (51%) than men (49%) in start-up business ventures.

Unfortunately, the performance and growth of women entrepreneurship was not equally in all industries (KALNINS; WILLIAMS, 2014). In some industries, such as high technology, they are still the minority. Such a situation can be seen in the technology-based incubators, with the predominance of men (TREANOR; HENRY, 2010; LINDHOLM DAHLSTRAND; POLITIS, 2013; MARLOW; MCADAM, 2012, 2015).

A recent event involving sexism in the Silicon Valley, one of the most known startup ecosystem in the world, gained relevance in some popular press media (GAMIO, 2017; KOKALITCHEVA, 2017; MUNDY, 2017) showing that gender discriminations can be a problem in male-dominated environments.

What is it like for women to create a new venture in the context of technological based incubators, a male-dominated environment? The main objective of the present study is to identify the strategies that women entrepreneurs employ at the business incubator to develop their businesses. It seeks to understand the entrepreneurship attitudes of women as they strive to gain space in a male-dominated context.

The article is divided into four parts. Following this introduction, we present the theoretical framework that forms the basis of the construct of the study. This is followed by the procedures used for the development, the results, analysis and conclusion.

Theoretical framework

Looking through the keyhole… What are Women entrepreneurs Like?

A review of the literature was conducted to understand the behavior of women entrepreneurs when they deal with their businesses. We observed that the apex of scientific production regarding women entrepreneurs began to be seen in the 1990s. We can cite, for instance, articles on female entrepreneurial competencies (NASSIF *et al*., 2012), the creation and opening of enterprises and the strategies developed by women (BAUN, 1994; MACHADO *et al*., 2003; RODRIGUES; WETZEL, 2003; DETIENNE; CHANDLER, 2007; RODRÍGUEZ; SANTOS, 2009), entrepreneurial ecosystems (NEUMEYER *et al*., 2019), and how women entrepreneurs manage their businesses (MACHADO *et al*., 2013).

In addition to these studies, McGowan *et al*. (2012) found that many women entrepreneurs, when reporting on their experiences, showed discontent with the amount of responsibility they assume, explaining that it is not an easy task to balance professional obligations with family. They claim that this is one of their most serious conflicts, given the expectation of their families, who require care, while at the same time they juggle this with their commitment to their businesses. Even so, they appreciate the freedom they enjoy to manage their own ventures.

Barbosa *et al.* (2011) studied the profile, multiple roles, conflicts and motives that lead women to launch their own business venture in the city of Aracaju, Brazil. They found that the women, despite of the variety of conflicts they face, seek to do the best they can with quality to satisfy their customers. They also work passionately which, according to the authors, enables them to create and affirm their values. There are also studies that discuss the motivational aspects through the dichotomy of necessity and opportunity for entrepreneurs (AMIT; MULLER, 1995; WILLIAN; ROUND, 2009; BLOCK; WAGNER, 2010; HUMBERT; DREW, 2010).

Another study, conducted by Jonathan and Silva (2007), showed the multiple roles of women entrepreneurs, seeking to discuss the strategies they use in their daily lives, the constant conflicts of workspace, family and professional commitments, in addition to personal issues. According to this study, to overcome these situations, they resort to strategies that focus on organizing their time, seek partnerships and find ways to reduce tension. Thus, they manage to innovate and transform the contexts in which they are embedded. Other conflicts identified in the professional role of women may lie in gender-related differences, as reported by Buttner and Moore (1997), Gundry and Welsch (2001), Kourilsky and Walstad (1998) and Machado (2002).

Entrepreneurship in the Technological Sector: Is there room for women entrepreneurs?

The creation of a technology venture is a combination of individual skills and market and technological conditions. Bessant and Tidd (2009) claim that a decision to undertake a venture begins with the desire to become independent and escape from the bureaucracy and tradition of a large organization. They also highlight that psychological profile, past experiences and work and family influence are factors that weigh on a decision to embark on a new venture.

In a study conducted in the United States, these authors found that schooling and training are important factors that set the creators of new technological ventures apart from other entrepreneurs. They also emphasize that, unlike ordinary entrepreneurs, technology entrepreneurs appear to have a moderate need for achievement and little need for affiliation. This suggests that the need for independence rather than a need to succeed is the most important motivator for entrepreneurs in this sector. In a study conducted on Route 128, Bessant and Tidd (2009) found that the entrepreneur's work experience is normally gained in business incubators, while technical entrepreneurs in Silicon Valley tend to gain their experience with a large number of companies before embarking on their own ventures.

From the perspective of minority groups, Baron and Shane (2007) found that in the United States the government shows the importance of this group by understanding that there is a need to encourage innovation for the economic health of the nation. The goal is to help transform creative and innovative ideas into new products or services, and encourage federal agencies to earmark a certain percentage of their contracts to small businesses that belong to minority groups. Women are included in these groups. According to the authors, this group has preference when it comes to contract and can receive consultancy in the form of technical and managerial assistance, in addition to financial aid in the form of investments.

In Brazil, Jonathan (2003), when researching women entrepreneurs in the technology sector, witnessed the difficulties they face in obtaining resources and funding for activities that require intensive innovation. Another recurring issue in studies of gender has to do with the prejudice and discrimination against women, especially when they are in higher positions that are traditionally occupied by men. This was a finding of Botelho *et al*. (2008), who conducted a study in the information technology sector. However, many studies have shown the conflicts experienced by women in both the family and professional context. Abreu (1993, p.126) highlights that "the construction of qualification is a sexual social construction" when explaining the advantages that men have over women in the technology sector. The author reports on serious difficulties faced by women who wish to evolve in their careers in this sector.

On the other hand, the challenges faced when creating a business in a technological environment are also marked by uncertainty and risk. Baron and Shane (2007) found that the entrepreneurship process involves numerous uncertainties, from the moment that the business

is founded, including technical, market, competitive and financial uncertainties. Thus, these authors explain that uncertainty and the asymmetry of information are important factors and, for this reason, entrepreneurs need to develop strategies to manage these dimensions of the business process. In the seminal work of Miles and Snow (1978), one of the proposals was to identify strategic behavior categories. The authors found four behaviors constituted by characteristics of the prospector, defender, analyzer and reactor.

Olson and Currie (1992), using these categories to understand the strategic choices of women entrepreneurs, identified three of them in their research. Characteristics of the reactor were not found. This shows that the concerns of women are not always focused on competition or the market. Although these aspects are important in a competitive environment like the technology sector, it appears that the behavior of women is more in the line of prospectors (showing concern over their products and services), defenders (showing apprehension, especially over the quality of the services they offer and provide) and analyzers (developing the capability to observe their competitors and always acting as a learner).

The findings in the literature, like the results of studies conducted by different authors regarding women entrepreneurs irrespective of their line of business, helped to shape the construction of the present study. In this sense, the study makes important contributions. First, it contributes to the research on the participation of women entrepreneurs in the labor market in a position of leadership in a sector that is predominantly masculine. The second contribution is that it shows how they overcome the difficulties and obstacles they face using informally and intuitively formulated strategies, often without using any planning to guide their professional actions.

Methodological procedures

The fundamental concern of qualitative research is to study and analyze the empirical world in its natural setting. This approach values direct contact between the researcher, the environment and the situation in question (GODOY, 1995). To this author, in this approach the direct contact between the researcher, the environment and the situation is highly relevant, as it enables a phenomenon to be well observed and understood in the context in which it occurs and of which it is a part. Furthermore, the author claims that qualitative research is more focused on the process than the results or products. Zahra and Wright (2011) suggest that the context of the entrepreneur should be treated not as a control variable but as part of the history of the social actors involved. Considering the nature of the present study, we opted for qualitative research. We chose the in-depth interview, with a semi-structured script, as the data collection instrument. The data were categorized and analyzed using content analysis (FLORES, 1994). This author argues that the identification and classification of elements consists of examining the units of data to find the thematic components that help to define the categories.

The context that was selected for the data collection was the Technological Enterprise Incubator Center (Cietec). This technological business incubator is the largest in Brazil in terms of the number of businesses involved. It provides support for entrepreneurs that use technology as their main input and have high value added products. At the time when the study was conducted, 109 companies were incubated. Therefore, it was possible to identify women entrepreneurs who were leading projects at the business incubator, and the strategies they chose to develop their businesses. Using a list provided by the Coordinator of the Center, we identified nine technology companies headed by women. We began to contact them by telephone and e-mail, inviting them to participate in the study and providing a brief explanation of its goals. Seven of these women agreed to participate and we continued to contact them to arrange dates and times to conduct the interviews. We interviewed all of them in the space provided for the work of women entrepreneurs. In addition to the respondents, we also counted on the participation of the Director of the Cietec, who granted us an interview to explain the participation of the women entrepreneurs in the context of the incubator.

To protect the identities of the participants, the women entrepreneurs will be identified as E1, E2, E3, E4, E5, E6 and E7. The Director will be referred to as CC, and his role in the study was to complement the information regarding the theme in question.

Results

Profile of the group of participants

Of the seven women in the study, four were born in the city of São Paulo, two are from the interior of the state and one is from the interior of Minas Gerais State. Five are aged between 40 and 50, and the other two are between 30 and 40 years old. These data corroborate the findings of Hisrich and Peters (2004), who found that most entrepreneurs begin their careers between the ages of 22 and 45.

Five of the entrepreneurs are single and have no children. One is married and has two children, and the other is married and is thinking of having children in the near future. In the interviews, it was possible to gauge their income and we found that the lowest income was approximately eight minimum wages. All the entrepreneurs had completed higher education. Four are engineers, two are teachers and one has a degree in physics. Education is viewed as very important when it comes to starting a business. Hisrich and Peters (2004) claim that formal education is not vital for starting a business, but it does provide good experience, especially when it comes to the field of the venture. This point was discussed with the interviewees and they unanimously agreed that higher education was a key point for achieving a space at the business incubator. It also conveys credibility to customers and provides a feeling of security in the business. Two of the entrepreneurs are seeking a place on a Master's Degree program. The Director has a bachelor's degree in law and has worked to CIETEC since 1997.

Categories of Responses

We analyzed and clustered the results into four categories. The first was Women entrepreneurs in the context of a business incubator. The second category organized the responses related to personal experiences, family, personal stories and experiences and daily life. We named this category as Women and their backgrounds. The third addressed attitudes and behaviors and we named it as Women entrepreneurs and their leadership of innovative projects. Finally, we named "Women entrepreneurs: obstacles and business strategies" the responses regarding the strategies used for the management and survival of their businesses.

Category 1 – Women entrepreneurs in the context of a business incubator

Being part of the Cietec, in addition to being a great achievement, was a dream come true for all the entrepreneurs. The environment of the business incubator provided them with great advances in their businesses, opening up new perspectives to expand their products, attract new customers, form networks and receive training through the help offered at the incubator. They state that it is a collaborative environment with access to learning opportunities. It especially acts as a facilitator and supporter of women who are beginning a technological business venture. None of the women showed embarrassment or discomfort over being in a predominantly male environment, claiming that they feel welcome and respected. According to the coordinator of the Cietec, the mission of the center is to encourage entrepreneurship and technological innovation by supporting the creation and development of micro and small technology businesses. He affirms that the presence of women at the center is very enriching.

I really like it when a project comes in that is proposed by a woman. These projects always have something different and they manage to transform the place, which, let's be realistic, is dominated by men. But all the women are made very welcome (CC).

I have never in my life, in the twenty years since I got my degree, felt any sort of prejudice about me being a woman. I've never had problems. I've always managed to find a job with men and

*always in the same income bracket. To be honest, I feel I have been benefited because I'm a woman (*E3).

*[...] being at the Cietec, being able to work on proposals that focus on innovation in education from a technological base (avant-garde technology), that was the greatest professional gain I've ever had in my life. I see this as something fundamental. I haven't been able to imagine education without technology for some time now... and it was here at the business incubator that I've had space to develop my product (*E5).

*My accomplishments have been creating a portfolio of clients, albeit a quite modest one. That all started after I came here. The idea of developing innovative projects in the technology sector is not as simple as it sounds. If you don't have any support and a place to develop your company, the challenges and obstacles are much bigger (*E7).

*[...] when you're at a business incubator, and quite a well-known one, that has a serious reputation, like the Cietec, it gives you credibility; that goes for everyone here, and their enterprise[...] (*E1).

Gomes *et al*., (2005) claim that women are entering the work market in sectors where they have never operated before and have been conquering in the business world a space that used to be predominantly occupied by men. They also claim that both men and women can have similar motives, but that men tend to focus more on the financial aspects, while the women seek satisfaction and desire a sense of achievement and independence. These aspects are in agreement with the findings of this study when comparing the income of men and women who operate in the same space and sector. The income of the women is almost twice as low as that of the men.

Category 2 – Women and their backgrounds

The interviewees are from lower middle-class families. They all had the opportunity to complete higher education and enter a profession. They claim that it was not easy. To study at university, they worked during the day and studied at night. Some of them, since adolescence, had to live with a sick mother, father or even a sibling and this hindered their studies and even their professional lives. Others report that the greatest family dramas revolved around financial issues such as unemployed fathers and siblings heavily in debt considering the family's standard of living. These situations always resulted in family conflict. For some of them, the idea of becoming an entrepreneur met with approval and support from family and friends. However, some also experienced opposition. Those who were not encouraged or who were discredited when they announced their project could not count on help from the family and faced criticism and rejection from close relatives.

[...] It was my daughter Julia who gave me a push to be here today, graduating in management from Mackenzie... she said to me, why don't you open your own company? You have what it takes to make it work. I told her it was too difficult and she told me about the incubator at USP[...] (E1).

[...] I was dismissed from the company where I worked... at first it was a bit of a drama. I had no job, no money and my father were ill. We couldn't count on any help from my brother,

because he had just got married and hardly had enough to support his own family. It was a bit difficult, but I managed to pull through. This was an interesting achievement because amidst the chaos, I identified an opportunity and, as always, I had pull it off on my own. I built up the courage and went for it. I think I put off my dream for a long time because I had a job. I didn't want to risk my security for something uncertain[...] (E2).

My husband had no faith in my project until I landed here. Even without the good income that I could get at a company, I know exactly where I want to go. Sometimes I feel that neither he nor my father are 100% behind me in this project, but they've got used to it. I am very stubborn and I want to go ahead (E4).

The main influence on me to get my business started was my family and close friends (E5).

*The project leaders that are with us and are part of this family have different personal and professional backgrounds of struggle, challenges, sad stories and other interesting stories, but in the end they are all winners (*CC).

The motivations that lead people to open their own businesses are not always clear and accurate, according to Julien (2010). To this author, there are entrepreneurs that wish to face the challenge to become successful in a new business. Others do it for social reasons combined with personal or family needs. Making a dream come true, as was the wish of the entrepreneurs in this study, was no easy task. They lived through complex situations and conflict, striving to find the equilibrium between personal, family and professional life. Conflicts do not always have positive results, according to Jonathan and Silva (2007) when showing the difficulty involved in handling multiple roles for women entrepreneurs, who sometimes have to dedicate themselves to family in detriment of professional needs. In this context, conflicts occur at work, as a result of family demands and personal issues.

Category3 – Women entrepreneurs and their leadership of innovative projects

One of the great challenges, and a great difficulty when it comes to entering the technology sector, according to the participants in this study, was writing a business plan and learning how to deal with bureaucracy. However, they claimed that gaining a space at the business incubator was so motivating that it helped them overcome these difficulties. Another aspect that helped them to overcome these problems was the support they received at the business incubator through training courses, individual tutorials and guidance from correlated sectors.

They claimed that to lead an innovative project, in addition to focusing on the product or service, the aspects that make the difference to the people that work in this sector involve valuing research and innovation, which are seen as indispensable ingredients when it comes to climbing to higher rungs in this context.

*[...] if you don't focus on a differentiated product, you can't survive in this technological space that is mainly devoted to education (*E5).

*I really like what I do, although it's not easy. But if I had to start over, I wouldn't change a thing. You have to have a passion for your product, you have to be certain that it is useful, you have to understand whether this need is yours or someone else's[...]so, you go for it and win a place, even if you're a woman (*E3).

*Putting the business plan together, the project, that was hard, but it was important when it came to getting in here. Today, I can't even remember it. I know that it guides our procedures. But when you're at the head of your business, you know what you need, you know what is important and necessary. I believe that it's a question of common sense and being reasonable (*E2*).*

*In practical terms, I'm always researching because every day I find new things on this market. And if I don't keep up, I'll be out of this market in a heartbeat. Anyone that wants to head an entrepreneurial technological project has to be smart, has to get up every day and suspect that somebody may be out there doing something better than you. But I'm not afraid of the competition. But I am aware of them (*E6*).*

*I'm really grateful for the opportunity of getting a space here. There are times when I can't believe I made it here. Even with all the difficulties I had to put the project together, the business plan, I never gave up. It was here that I found my place in the sun[...](*E7*).*

*[...] with information technology, you see that lots of things that people were doing until not so long ago by phone or having to go in person, you can do at home today. You have a computer and use the internet, so this technology for computers, it seduces people a lot because it's practical and reduces costs. You end up getting involved and it's as if you couldn't manage to live without it. I think this is a motivating factor and technology is something that is closely related to entrepreneurship[...] (*E1*).*

*Women can lead an innovation project as well as men. In fact, I don't even pay attention to these gender-related issues. Women are responsible and they are fighters. But when we select projects, I always ask the following question: will this project be important and strategic for our country? (*CC*).*

Some of the women entrepreneurs reported that the indicators of the Brazilian economy are predicting a difficult and unstable period for entrepreneurs in the technology sector, as it is a difficult time to obtain resources and taxation rates are high. These factors lead to instability in business situations. On the other hand, to undertake a venture in a context that offers support, such as the business incubator, ensures a certain degree of tranquility. Furthermore, the women claim that the motivational aspects outweigh the difficulties and the tide of pessimism created by our unstable economy. They claim that they have always felt they would triumph. The study by Humbert and Drew (2010) corroborates these arguments when they affirm that the perception of a potential market opportunity is sustained by the belief in winning. In relation to leading innovative projects in the technology sector, it is clear that there is a need to invest in research, confirming the findings of Amit and Muller (1995), who claimed that possible failures in entrepreneurial ventures are the result of a lack of planning and investment in the field in question.

Category 4 – Women entrepreneurs: obstacles and business strategies

The respondents told of the difficulties and obstacles that they face in their daily business lives. Furthermore, they explained which strategies they use to overcome complex situations that hinder their activities. They all agreed that, even in the environment of the business

incubator, they struggle to obtain resources for the maintenance, growth and development of new products. They are reluctant to think of the day when they will have to transfer to the labor market, as they know that outside the incubator the situation is considerably different. Some of their statements illustrate their concerns.

Of course, I am afraid to leave here. Here, we have help and support, and it is easy to get help... outside, we have to get by on our own. That terrifies me (E4).

*I'm sure about what I do. I have a different product and I innovate whenever I can. But I recognize that you have to fight out there and that it is really different. Sometimes I'm afraid to leave here. But I know that the time will come and I need to get ready for it (*E6).

*Here it's every man for himself. But we know that there is always someone around that can help us when we need it. Out there??? You're all alone (*E1).

The fear of facing the labor market is discussed by Botelho *et al*., (2008) and Zahra and Wright (2011), who claim that the history and reluctance of social actors need to be understood within the context in which they live.

However, the respondents also spoke of the strategies they use to overcome their difficulties and fears.

I prepared a business plan. It was hard, but it was good. This doesn't mean that I base everything I do on it. The market is dynamic and unstable. In this sector, things are changing all the time, and if we don't keep up, we're goners. So, I keep my eyes peeled and my ears to the ground. We need to feel and perceive changes. I talk to people a lot and try to keep up with the market, even though I'm here at the business incubator (E2).

We're here, but things don't stop changing and you have to be on your toes. The preferred strategy that I use from day to day is my knowledge and confidence that I have in my product. It isn't easy, but if I didn't believe in the importance of what I do, I wouldn't be here (E7).

I believe that my biggest worry is to develop strategies for obtaining resources and finding customers. That why I make an effort to use my networks, present innovations whenever possible and keep up with the changing market (E4).

[...] being innovative isn't enough. You have to have a product, equipment and innovation in general that will meet the needs of the market. There's no point in innovating to make a product that no one will ever use or that doesn't really serve a purpose[...] (E3).

[...] you need some balance to deal with the market. You really have to believe in yourself and that you can overcome the obstacles in your way, and that you are greater than these obstacles. Furthermore, my daily strategy is to know everything that's going on and keep up with what they're doing out there

so that I can do it better in here. I also worry about the concept I have in the market and so every day I do research about my field and my business[...] (E6).

After taking risks with some strategies, more in terms of a formal plan, I understood that the most important thing for survival and overcoming barriers is to learn to keep your eye on the inside and on the outside. When I say inside, I mean inside myself. Outside, of course, is the market and the many changes that take place (E1).

Here, I use the same strategy that I used to adopt in the classroom. I observe the pace of what is going on in the market and how quickly things change. But I look at myself and ask... do I feel secure? Do I have the right profile for this? It's really important to be aware of what other people need in the modern world. I think that this profile of a teacher and researcher dictates the strategies I employ in daily life[...] (E5).

There have been significant changes in how professional relationships are conceived and in terms of entrepreneurial strategies (Machado *et al*., 2013) in the opinion of the partici-pants. Fear, insecurity and reluctance are part of this scenario, especially when these women have to address difficulties and face obstacles. Regarding strategies, they leave no doubt that self-confidence, sensibility and perception are their allies when it comes to handling their busi-nesses. The study by Humbert and Drew (2010) shares these sentiments, leading us to believe that these characteristics are typical of women entrepreneurs. This has also been noted in the works of Nassif *et al*. (2012) and Baum (1994).

The most recurrent behaviors in the group in question are courage, proactivity, opti-mism, confidence and self-control. These behaviors are confirmed by the coordinator of the business incubator, who works alongside the women entrepreneurs at the Cietec.

One year later: Interviewees status update.

One year after these interviews, we tried to get in touch with these entrepreneurs to follow-up their current endeavor status. Below is a brief description of their statements:

E1 – Left Cietec in June 2014. Kept her business working from home. She lost many customers acquired at Cietec. Claims that the incubator helps in fidelity and after she left it everything became complicated. Has faced many difficulties to stay in business, because the market is increasingly competitive and very innovative. She failed financing her innovations and seeking out new tools to modernize the business. Has sought to make some informal short term work (not meant what) in the free time to make some money. She said that would come back quickly to the incubator if she could. She is very sad and afraid of the current Brazilian economic context. If she has a chance to get a job she wouldn't think twice, claiming that being an entrepreneur in Brazil is not enough to have stability, mainly in the technology market, changes are constants and unstable – full of ups and downs.

E2 – She is very well, business is growing and expanding. She left Cietec in February, 2014 and did a very strong work with customers, sought partnerships with other similar bu-sinesses and opened contact with different vendors. Revenues has grown 5% in comparison to the incubator period and that is great for technology market. States that it is an expensive, competitive market, which requires constant presence of the entrepreneur. In this sense, she believes she got a good education at Cietec. She never wondered the reality of the market, although she has undergone many fears, anxieties and disappointments. In average, she feels a positive balance. She had rented an office, but when the situation began squeezing financially, she moved to home office, isolating the rest of the house. She lives in an accessible place and everything is simpler. With the rent savings she invested in new tools and a good portion on

her self development. She takes courses and study hard. She started a master's degree course, but did not identified herself with the academic world and quit a few months later. She believes that the current conditions in Brazil are not helping at all entrepreneurs, but she is not depending on anyone nor anything to stay on the market. She thinks about going back to the countryside, but she thinks that everything could be even more difficult than in the capital.

E3 – Not found.

E4 – She sold her product to a midsize business (it was a finance app for inventory control, logistics and results) and was hired to manage the system. She was feeling safer, at least for a fixed monthly income. Claims that at the incubator it was simpler to work, but when she went to the market (November, 2013), she found it was not that easy. Being small showed how fragile was her business. The period in the incubator was when she learned a lot, developed skills and acquired confidence, which helped a lot to sell the product, get a job and continued working with the system. She lost her hope in Brazil. She often cries when she see that things could have been different.

E5 – Not found.

E6 - Continues leading technological research projects. Suffered a lot when she left Cietec (May, 2014). She had a principle of depression, but managed to overcome quickly when she realized that nothing she was feeling would help her business. Then she went through the market with everything. She said the product was differentiated and customers' loyalty was vital because they kept buying from her even outside the incubator. This gave her a lot of strength and courage. She rented a small office of two rooms and has an intern. Her biggest strategy was not to lose sight of the market, especially the technology market. Whenever she notices any change, she investigates everything, who's doing it, who's using it. Then tries to be ahead of them, doing the best she can and, preferably, better than the others. She doesn't give up to the economic instability. For her, Brazil always lives in crisis, if not social, environmental, financial, lack of water, gas shortage, lack of manpower, there is always something missing. So, she learned to live in this environment of chronic instability and the opportunities are found in this environment. She regrets, but said that it's true. She said that several competitors jumped back, afraid of the market. She grabbed these spaces.

E7 – She returned to the market after trying for almost 1 year stay, but failed. She is working in a multinational tech company with no connection with what she was doing. She said it was impossible to stay on the market. Has saved her product, because she believes on the day it will work. Claims that in the incubator it was all very different. She had space, support, and out of there, she was completely alone. She didn't give up, it's just a break, because everything is very expensive, employees, rent, tools, among other things she needs to keep the business.

Interviews analysis

Although E1 knew how difficult it would be to manage her business after leaving Cietec, she was clearly not prepared for the entrepreneurial journey. Baron and Shane (2007) uncertainties has exerted a strong impact on her performance. She really missed the protection of Cietec and felt the threats of the outside world. The fact that she relied on Cietec reputation could have weakened her capacity to build hew own brand and self-confidence.

E2, on the other hand, had already lived a frustrating experience before Cietec, when she lost her job and used that fact to drive her efforts to pursue her dreams, which Cietec gave a good push. So, she went to the market better prepared, by writing a business plan in order to anticipate the risks and reduce uncertainty. More important than the business plan was her correct assumption that the world is in constant change and she has to keep her eyes and ears open all the time to perceive the changes as stated by Machado *et al* (2013).

We see an opposite behavior on E4 statements. When she was incubated she demonstrated insecurity about her future and faced lot of problems and difficulties on the market. Maybe the lack of support in her family could be part of the explanation for such behavior, confirming the findings of Abreu (1993), but the fact is that she did not pay to see the outcomes.

Selling the product and agree to have an employee status is not a surprising end under such point of view.

It seems that the entrepreneur with the behavior that is better explained by the literature is E6. The statements during and after incubation was the best aligned among all the interviewees, showing coherence in terms of putting in execution the preparation plan, but also the development of the entrepreneurial women characteristics (Humbert and Drew, 2010). E6 showed a strong sense of reality, very firm on her competitive strategy and the self-confidence and determination to face uncertainty and environmental threats.

Finally, we see that E7, like E1, was not prepared to go to the market. All her statements during the incubation period show her gratefulness of being at the incubator, nothing that could be referred as some kind of planning for the future, just like the incubator being the end of the journey for her. Because of that, it is not surprising why she gave up and ended up back to the job market, confirming the findings of Amit and Muller (1995).

Conclusions

The general aim of this study was to identify the strategies that women entrepreneurs in business incubators use to develop their businesses. It also sought to understand the attitudes of these women in their efforts to gain a foothold in a male-dominated context. This theme has aroused the interest of researchers, and is still in its infancy, especially in the Brazilian literature. The study was exploratory and qualitative in nature, seeking to explore this process as experienced by women incubated at a center of technology and leading projects of this nature. The study revealed evidence of typical female behavior, even when the scenario suggested that other behaviors might be expected, with the situation being technological projects led by women entrepreneurs rather than men. Therefore, sharing the experience of heading a technological project contributes to considerations concerning policies for incentives, as this was one of the difficulties reported, especially when it comes to obtaining resources.

Another interesting aspect is their indifference to being women in this context. The interviewees showed no sign of embarrassment or difficulty in terms of gender-related issues, even though they understood that men continue to be in the majority in this field. However, they did notice a certain preference and greater facility for men in the business, not only at the business incubator but also in the market in general.

The women used formal strategies to be admitted to the business incubator. However, formal plans do not seem to be their preference in their daily lives and in their business dealings. Once again, we identified typically female attitudes and behaviors, especially when they prioritize affective aspects in detriment of cognitive ones. Although these aspects are the most frequently used personal resources of the women when managing their businesses, they also state that it is important to be aware of what is happening inside and outside and that monitoring changes in the market is a key aspect for the success of a business.

The interviews with the entrepreneurs after one year clearly confirm the importance of planning and the development of this environment perception feeling as they were common aspects among the three entrepreneurs who did not give up their businesses.

Additionally, we can also conclude that inner motivation to succeed plays a very important role on the entrepreneurs' will to overcome threats and barriers against their businesses. In most cases, we see the lack of inner motivation in the answers of discontinued entrepreneurs and full of optimism and energy in the answers of the other entrepreneurs. They were all confronted with the same obstacles and aggressive external environment after leaving the incubator, but only those who showed to be more prepared and more connected to their business were able to keep fighting to maintain the business alive.

Despite the fact that the research data are valuable for learning in the field, we cannot generalize the results, as a great deal remains to be studied regarding the issue of gender. Therefore, these results are robust for the sample in question and help to generate interest in conducting further studies. These studies could include increasing the number of respondents from the same sector, irrespective of whether or not they are in a business incubator. They

could also examine findings in other countries and draw comparisons with Brazilian data. We could also research public or private policies for including women entrepreneurs more effectively in the context of a field that is predominantly masculine.

References

Abreu, A.R.P. **Mudança tecnológica e gênero no Brasil**: primeiras reflexões, Novos Estudos, Vol. 35, pp. 21-132, 1993.

AMIT, R; MULLER, E. Push and pull entrepreneurship. **Journal of Small Business and Entrepreneurship**, Vol. 12 No. 4, pp. 64-80, 1995.

BRUIN, A; BRUSH, C.G; WELTER, F. Advancing a framework for coherent research on women's entrepreneurship. **Entrepreneurship Theory and Practice**, Vol. 31 No. 3, pp. 323-339, 2007.

BARBOSA, F.C; CARVALHO, C.F; SIMÕES, G.M.M; TEIXEIRA, R.M. Empreendedorismo feminino e estilo de gestão feminina: estudo de casos múltiplos com empreendedoras na cidade de Aracaju – Sergipe. **Revista da Micro e Pequena Empresa**, Vol. 5 No. 2, pp. 124-141, 2011.

BARON, R.A; SHANE, S. **Empreendedorismo**: uma visão de processo, Thomson Learning, São Paulo, SP, Brazil, 2007.

BAUM, W. Jr. The relation of traits, competencies, vision, motivation, and strategy to venture growth, **Doctoral Dissertation**. University of Maryland, College Park, Maryland, 1994.

BESSANT, J; TIDD, J. **Inovação e empreendedorismo**, Bookman, Porto Alegre, Brazil, 2009.

BLOCK, J.H; WAGNER, M. Necessity and opportunity entrepreneurs in Germany: characteristics and earns differentials. **Small Business Review**, Vol. 62, pp. 154-174, 2010.

BOTELHO, L.L.R; SCHONS, C; VIEIRA, B; CUNHA, C.J.C.A. Desafios gerenciais das mulheres empreendedoras: como exercer a liderança em espaços de identidade masculina? O caso da Alpha Tecnologia. paper presented at the **XIX Congreso Latinoamericano y del Caribe Sobre Espiritu Empresarial**, Brazil, 2008.

BUTTNER, H; MOORE, D. Women's organizational exodus to entrepreneurship: self-reported motivations and correlates with success. **Journal of Small Business Management**, Vol. 35 No. 1, pp. 34-47, 1997.

DETIENNE, D.R; CHANDLER, G.N. The role of gender in opportunity identification. **Entrepreneurship Theory and Practice**, Vol. 31 No. 3, pp. 365–386, 2007.

FLORES, J. G. Análisis de datos cualitativos: aplicaciones a la investigación educativa. **Promociones y Publicaciones Universitarias**, Barcelona, Catalonia, Spain, 1994.

FORAY, D; HARGREAVES, D. The production of knowledge in different sectors: a model and some hypothesis. **Report Research**, Université Paris Dauphine, 2002.

GAMIO, L. Silicon Valley's sexist swamp. **Axios**. Available at: https://www.axios.com/silicon-valleys-sexist-swamp-2446837635.html. Accessed: 23 July, 2017.

GEM - Global Entrepreneurship Monitor. Empreendedorismo no Brasil. **Instituto Brasileiro Qualidade e Produtividade – IBQQ**, Curitiba, Paraná, PR, Brazil, 2017.

GODOY, A.S. Uma revisão histórica dos principais autores e obras que refletem esta metodo-

logia de pesquisa em Ciências Sociais. **Revista de Administração de Empresas,** Vol. 35 No. 2, pp. 57-63, 1995.

GOMES, A.F; SANTANA, W. P; SILVA, J.M. Mulheres empreendedoras: desafios e competências. **Revista** Técnica **Administrativa**, Vol. 4, pp. 24, 2005.

GUNDRY, L; WELSCH, H. The Ambitious Entrepreneur: High Growth Strategies of Women-Owned Enterprises. **Journal of Business Venturing**, Vol. 16 No. 5, pp. 453-470, 2001.

HISRICH, R. D; PETERS, M. P. **Empreendedorismo**. Bookman, São Paulo, SP, Brazil, 2004.

HUMBERT, A.L; DREW, E. Gender, Entrepreneurship and motivational factors in an Irish context. **International Journal of Gender and Entrepreneurship**, Vol. 2 No. 2, pp. 173-196, 2010.

JONATHAN, E. G. Empreendedorismo feminino no setor tecnológico brasileiro: dificuldades e tendências. **Proceedings of** 3º Encontro de Empreendedorismo e Gestão de Pequenas Empresas, EGEPE, Brasília, DF, Brazil, pp. 41-53, 2003.

JONATHAN, E.G; SILVA, T.M.R. Empreendedorismo Feminino: Tecendo A Trama De Demandas Conflitantes. **Psicologia & Sociedade**, Vol. 19 No. 1, pp. 77-84, 2007.

JULIEN, P. A. **Empreendedorismo regional e a economia do conhecimento**. Saraiva, São Paulo, SP, Brazil, 2010.

KALNINS, A; WILLIAMS, M. When do female-owned businesses out-survive male-owned businesses? A disaggregated approach by industry and geography. **Journal of Business Venturing**, Vol. 29 No. 6, pp. 822-835, 2014.

KOKALITCHEVA, K. Women in Tech Share Advice for Solving Silicon Valley Sexism. **Axios**. 30 jun. 2017. Available at: https://www.axios.com/y-combinator-conference-women-founders-in-tech-solving-sexism-2450684977.html. Accessed: 23 July 2017.

KOURILSKY, M.L; WALSTAD, W.B. Entrepreneurship and female youth: Knowledge, attitudes, gender differences, and educational practices. **Journal of Business Venturing**, Vol. 13 No. 1, pp. 77-88, 1998.

LINDHOLM DAHLSTRAND, Å; POLITIS, D. Women business ventures in Swedish university incubators. **International Journal of Gender and Entrepreneurship**, Vol. 5 No. 1, pp. 78-96, 2013.

MACHADO, H.V. Identidade empreendedora de mulheres no Paraná. **Doctoral Thesis**, Universidade Federal de Santa Catarina, Florianópolis, Santa Catarina, SC, Brazil, 2002.

MACHADO, H. V; ST-CYR, L; MIONE, A; ALVES, M.C.M. O processo de criação de empresas por mulheres. **RAE-Eletrônica**, Vol 2 No. 2, pp. 1-22, 2003.

MACHADO, H.V; GAZOLA, S; ANEZ, M.E.M. Criação de empresas por mulheres: um estudo com empreendedoras em Natal, Rio Grande do Norte. **Revista de Administração Mackenzie,** Vol. 14 No. 5, pp. 177-200, 2013.

MARLOW, S; MCADAM, M. Incubation or induction? Gendered identity work in the context of technology business incubation. **Entrepreneurship theory and practice**, Vol. 39 No. 4, pp. 791-816, 2015.

_____. Analyzing the influence of gender upon high-technology venturing within the context of business incubation. **Entrepreneurship Theory and Practice**, Vol. 36 No. 4, pp. 655-676, 2012.

MCGOWAN, P., REDEKER, L.C., COOPER, S. & GREENAN, K. Female entrepreneurship and the management of business and domestic roles: Motivations, expectations and realities. **Entrepreneurship and Regional Development**, Vol. 24 No. 1-2, pp. 53-72, 2012.

MILES, R.E; SNOW, C.C. **Organizational strategy, structure, and process**. McGraw-Hill, New York, NY, 1978.

MUNDY, L. Why is Silicon Valley so Awful to Women? **The Atlantic**. Available at: at https://www.theatlantic.com/magazine/archive/2017/04/why-is-silicon-valley-so-awful-to-women/517788/. Accessed: 23 July 2017).

NASSIF, V.M; ANDREASSI, T; TONELLI, M.J; FLEURY, M.T. Women entrepreneurs: discussion about their competencies. **African Journal of Business Management**, Vol. 6 No. 26, pp. 7694-7704, 2012.

NEUMEYER, X; SANTOS, S. C; CAETANO, A; KALBFLEISCH, P; Entrepreneurship ecosystems and women entrepreneurs: a social capital and network approach. **Small Business Economics**, Vol. 53, No. 2, pp. 475-489, 2019

OLSON, S.F; CURRIE, H.M. Female entrepreneurs: personal value systems and business strategies in a male-dominated industry. **Journal of Small Business Management,** Vol. 30 No. 1, pp. 49-57. 1992.

RODRIGUES, M.E; WETZEL, U. As motivações das empreendedoras de serviços de bufês do Estado do Rio de Janeiro na decisão de iniciar o seu negócio. **Proceedings of XXVII Encontro Nacional de Pós-Graduação em Administração – EnANPAD**, São Paulo, SP, Brasil, v. 27, 2003.

RODRÍGUEZ, M.J; SANTOS, F.J. Women nascent entrepreneurs and social capital in the process of firm creation. **International Entrepreneurship Management Journal**, Vol. 5 No. 1, pp. 45-64, 2009.

TREANOR, L; HENRY, C. Gender in campus incubation: evidence from Ireland. **International Journal of Gender and Entrepreneurship**, Vol. 2 No. 2, pp. 130-149, 2010.

WILLIAMS, C.C; ROUND, J. Evaluating informal entrepreneurs' motives: evidence from Moscow. **International Journal of Entrepreneurial Behavior & Research**, Vol. 5 No. 1, pp. 94-107, 2009.

ZAHRA, S.A; WRIGHT, M. Entrepreneurship's Next Act. **Academy of Management Perspectives**, Vol. 25 No. 4, pp. 67-83, 2011.

ZAPATA-HUAMANÍ, G. A; FERNÁNDEZ-LÓPEZ, S; RODRÍGUEZ-GULÍAS, M. J; RODEIRO-PAZOS, D. Technology Entrepreneurship and Gender in Emerging Countries. In: **Sustainable Entrepreneurship**. Springer, Cham, pp. 47-62, 2019.