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EDUCATION FOR SUSTAINABILITY BEYOND THE CLASSROOM: COMPANIES BORN IN UNIVERSITY INCUBATORS

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ABSTRACT

The objective of this article was to understand the sense of developing a business which incorporates sustainability principles, and debating the role of the university in fostering socio-environmental practices among the new generation of entrepreneurs, with a focus on Brazilian experiences. The intention was to fill a gap in the literature, which focuses its efforts on the analysis of the education for sustainability in formal business courses and not on the incubation spaces at universities. This qualitative research investigated companies in incubator programs at four Brazilian university business incubators regarding the attention to the way the business project is selected in the incubators; the sources and nature of the incubators' socio-environmental concerns, the meaning of sustainability for these entrepreneurs, the way they put these principles into action in their business plans, the difficulties and challenges they face in meeting socio-environmental goals in their companies, and the inductor incubator's role in fostering sustainable businesses. The results shows that the actions of these young entrepreneurs externalize, more than anything, a concern with developing products and services which reduce environmental damage. Despite this being a laudable effort, it gives little indication that this generation of entrepreneurs is reviewing traditional management presuppositions or proposing new business formats regarding sustainability. Beyond this, the results also show that the investment in education for sustainability at university incubators seemed to be almost nonexistent, which has consequences for generations of born and raised companies in this academic environment.

Keywords: Entrepreneurial education; Sustainability; University incubators.

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EDUCAÇÃO PARA A SUSTENTABILIDADE ALÉM DA SALA DE AULA: EMPRESAS NASCIDAS EM INCUBADORAS UNIVERSITÁRIAS

RESUMO

O objetivo deste artigo foi compreender o sentido de desenvolver uma empresa que incorpora princípios de sustentabilidade e debater o papel da universidade na promoção de práticas socioambientais entre a nova geração de empresários, com foco nas experiências brasileiras. A intenção era preencher uma lacuna na literatura, que concentra seus esforços na análise da educação para a sustentabilidade em cursos de negócios formais e não nos espaços de incubação nas universidades. Esta pesquisa qualitativa investigou empresas em programas de incubação em quatro incubadoras universitárias brasileiras, em relação à atenção à forma como o projeto de negócios é selecionado nas incubadoras; às fontes e a natureza das preocupações socioambientais das incubadoras; o significado de sustentabilidade para esses empreendedores; ao modo como seus princípios em ação em seus planos de negócios; às dificuldades e os desafios que enfrentam no cumprimento dos objetivos socioambientais em suas empresas e, finalmente, o papel indutor das incubadoras universitárias na promoção de negócios sustentáveis. Os resultados mostram que as ações desses jovens empreendedores externalizam, acima de tudo, uma preocupação com o desenvolvimento de produtos e serviços que reduzam os danos ambientais. Apesar de este ser um esforço louvável, pouco indica que esta geração de empreendedores esteja revisando os pressupostos tradicionais de gestão ou propondo novos formatos de negócios em relação à sustentabilidade. Além disso, os resultados também mostram que o investimento em educação para a sustentabilidade em incubadoras universitárias parece ser quase inexistente, o que tem consequências para gerações de empresas nascidas e criadas neste ambiente acadêmico.

Palavras-chave: Educação empreendedora; Sustentabilidade; Incubadoras universitárias.



1. INTRODUCTION

The discussion about the university's importance as a key institution for understanding socio-environmental problems, and its co-responsibility in creating sustainable solutions for the future (Wright & Horst, 2013), has focused almost entirely on formal business courses and on the training of teachers and researchers. However, business incubators born in this environment and their capacity for fostering the creation of new sustainable companies have received little attention in the literature.

Albeit protected within an incubation environment, nascent companies do not operate in a vacuum. On the contrary, they begin to function in a "risk society" (Beck, 2007), where many interests oppose and complement one another. Social, environmental, economic, and political threats assume proportions beyond the scope of the institutions which control and protect society. This leads to the dissemination of the idea that the generating causes of the complex problems we experience can only be reversed through a profound change in the knowledge systems, values, and social practices. This change comes partly from the educational system (Sterling, 2011; Springett, 2005; Wals, 2010), and higher education institutions have responded with programs and courses dedicated to sustainability (Hall, Daneke, and Lenox, 2010). As a result, a series of initiatives and studies has begun to document teaching-learning experiences in this direction (Kearins & Springett, 2003; Svoboda & Whalen, 2004; Annandale & Morrison-Sounders, 2004; Springett, 2005; Collins & Kearins, 2007, Brunquell, Brunstein, & Jaime, 2015). From the 1970s, many higher education institutions around the world became signatories of international declarations committed to incorporate and nurture socio-environmental sustainability presuppositions of higher learning (Wright, 2010).

This institutional environment, which pressures the university education of young people to incorporate sustainability presuppositions (Mcnamara, 2010), imposes on business incubators, especially those within university contexts, the responsibility of fostering the development of new sustainable companies. However, little is known at present about how incubators are assuming this task, or about how nascent entrepreneurs have been applying sustainability principles in their business projects within this space. Thus, two research questions arise:



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- a) *What does it mean for the new generations of entrepreneurs to incorporate and execute sustainability principles in their business projects at university business incubators?*
- b) *What role do these incubators play in fostering the socio-environmental practices of the new generation of entrepreneurs?*

These two questions complement each other and explain the assumptions made in this study. Like Sandberg and Targama (2007), we believe that individuals' understandings are formed intersubjectively in specific social contexts. This means that the ways that entrepreneurs understand and incorporate sustainability into their business are influenced to a large extent by the university incubator environment. We also agree with several authors (Wright & Horst, 2013; Cincera et al., 2018) that universities play a fundamental role in the formation of a generation with a sustainable conscience.

The experiences selected for this study occur within the strong entrepreneurial culture of Brazilian society, more specifically São Paulo. The richest state in the union with one of the world's largest cities as its capital, São Paulo concentrates the universities with a long tradition in the education for entrepreneurship and incubation of the companies. . The units of analyses were the projects of young entrepreneurs who incorporated sustainability into their business goals at four Brazilian incubators linked to universities.

The study of the Brazilian experience in this context can serve as a reference for comparative studies, indicating how sustainability has been incorporated into the business projects of young nascent entrepreneurs. It also opens space for a discussion about the education of entrepreneurs on business incubators at higher education institutions in the face of the sustainability presuppositions and challenges.

2. ENTREPRENEURIAL EDUCATION AND SUSTAINABILITY

With the same strength that innovation and entrepreneurship emerge in the literature as important transformation mechanisms for responding to socio-environmental demands comes suspicion of sustainable entrepreneurial action, which is generally portrayed optimistically as a panacea (Hall, Daneke, & Lenox, 2010). This



is because entrepreneurship directed at sustainable development requires more radical changes than incremental changes, as well as the development of competencies of a different nature in order for businesses to meet stakeholder interests (Hall & Wagner, 2012).

Entrepreneurial education, whether undergraduate or postgraduate, has also been portrayed as an important mechanism for fostering sustainable action. According to Figueiró and Raufflet (2015), the Brandtland report and criticisms of the teaching systems carried out during the Rio-1992 Conference stimulated the creation of various educational programs, believing that it would be able to help create a sustainable society. The idea that education should take on principles and values related to sustainability in order to stimulate a more sustainable future has become part of the UN recommendations (Parra, 2013). In this context, Lans et al. (2014) argued that entrepreneurial education oriented towards sustainability plays an important role for the sustainable development of society. There is a challenge for the projection of sustainability-oriented entrepreneurship curricula as part of a social learning process (Cincera et al., 2018).

However, some authors highlight its limitations. The study by Kuckertz and Wagner (2010) shows that the effect of entrepreneurial education is moderate because even students who already lean towards sustainability tend to lose this inclination when their business experience begins.

There is yet a series of problems that debilitate educational actions, such as: a) structuring inter and transdisciplinary teaching in entrepreneurial education hinders the development of this culture, b) the fact that curricula have not been able to significantly strengthen social innovation, and c) the difficulty of training a qualified teaching body which contributes effectively to this entrepreneurial education directed at solving socio-environmental problems and goals.

From the didactic point of view, Springett's (2005) observation adds that sustainability requires active teaching-learning methodologies capable of leading students to criticism, reflection, engagement, and action towards socio-environmental responses, which one doesn't always observe in teaching experiences. Without advances in this field, it is questionable how much innovation these educational experiences can bring to the local community where businesses are created and developed. In other words, while there is a tendency for entrepreneurship to advance



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in university curricula worldwide, learning directed at sustainability is still in its infancy (Miller, Wesley, & Williams, 2012).

But despite the obstacles, these authors still believe in the potential of educational experiences. The competencies to be developed in this context relate to the capacity to understand the needs of people at the base of the pyramid or in vulnerable situations. It is a question of fostering a strategic perspective for the organization, focusing on social demands. Cognitive and ethical abilities are needed for making decisions when dealing with complex social problems and dilemmas. Along with sensitivity to social demands, understanding of problems, generosity, and enthusiasm, these abilities emerge in the literature as psychological elements that motivate and contribute to effective business actions in this context. In other words, not only are cognitive and technical-operational components required, but it is also important to stimulate attitudes and values (Kickul, Janssen-Selvadurai, & Griffiths, 2012; Nga & Shamuganathan, 2010; Burgete et. al, 2012; Kwong, Thompson, & Cheung, 2012; Miller, Wesley, & Williams, 2012; Orhei, Bibu, & Vinke; 2012).

However, in order to discuss the education of these entrepreneurs, it is necessary to understand what the literature describes in relation to the sustainable entrepreneurship universe. Three points in this debate are worthy of note because they make it possible to better evaluate the direction taken by entrepreneurial actions and their potential:

The first point deals with the reach of initiatives. When operating within the logic of human development, it is worth asking whether a business action is in service of individual or group gain, or for the benefit of an organization, community, nation, or the humanity (Kuchinke, 2010). From this perspective, sustainable entrepreneurship is defined as the performance of sustainable innovation with the objective of reaching a mass market and benefiting a broad section of society. As Markman et al. (2016) emphasized, there is a need to encourage ethical and sustainable entrepreneurship not only to minimize harms but also seek to regenerate the environment and generate positive societal changes.

The literature has often dealt with it as a specific type of entrepreneurship (Schaltegger & Wagner, 2011). In this case, the fundamental characteristic is that activities are less directed at the management system or technical procedures and more focused on initiatives and the entrepreneurial person's or group's abilities to



promote changes with large-scale social and environmental innovations in the market. The entrepreneur's, or entrepreneurial group's, rationale, the logic that drives actions, is different from what it would be in conventional entrepreneurship.

This rationale leads us to the second point, *organizational design*. There is a need to develop new organizational forms, innovative business models, and new governance mechanisms (Markman et al., 2016). For Parrish (2010), the success of entrepreneurial activity gains another meaning, different from the conventional logic of measuring and evaluating company performance. Here it is a question of attempting to overcome tensions which creates management that is anchored in values that seek to balance individual interests with the interests of the other – the other being nature and people. Organizational design aimed at social and ecological goals differs from the conventional principles of entrepreneurship and depends on the motivations and values of entrepreneurs. To Parrish (2010), organizational design within the logic of sustainable development guiding entrepreneurial action manifests itself in five principles:

a) *Resource perpetuation*: in this case, the existence of the organization is justified by its interest in producing beneficial flows through the reinforcement and maintenance of quality of life and natural resources for the longest possible time;

b) *Benefit stacking*: efficiency springs from the search for synergy, from the capacity to generate as many benefits for stakeholders as possible;

c) *Strategic satisfaction*: there is an attempt to identify and balance competing objectives strategically. The purpose is to ensure satisfactory results among multiple objectives, with both qualitative and quantitative results;

d) *Qualitative management*: criteria are established in order to define priority actions. This is management that considers the qualitative effects of decisions and not merely the quantitative ones. The quality expected from results and processes is a decision criterion;

e) *Worth contribution*: benefit flow and allocation favor worthy recipients, those stakeholders which are deemed most important and who provide opportunities to contribute to the company.

In summary, the meaning of business success, and the way it is measured, using more than quantitative metrics, changes in this context. A third point to consider



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is the *sustainability dimensions considered*. The idea that to be considered sustainable an organization must simultaneously generate economic, social and environmental development (Azapagic, 2003), establish fair relationships with suppliers, employees and consumers (Krajnc & Glavič, 2005) and seek measures that promote conscious use of natural resources seems a distant ideal. If other sustainability dimensions are considered, as according to Sachs (1986) and Söderbaum (2008), who refer to questions of health, human rights, poverty reduction, justice and cultural diversity, among others, the idea of what constitutes a sustainable company gains even greater complexity. This is because, ultimately, it would lead to the question of what type of business and what type of industry are in the interest of a sustainable society. And here it is worth remembering Springett's (2005) warning when talking about sustainability for business that there is great concern about what companies *do* rather than what companies should *be*.

Even when we consider only the environmental, social, and economic dimensions, the warning is still present. Schaltegger and Wagner (2011) characterized four main forms of entrepreneurship directed at sustainability. Ecoentrepreneurship, which aims chiefly to respond to environmental problems, social entrepreneurship, which seeks to attain social goals and gather funds for this purpose, institutional entrepreneurship, which works towards changing the regulations of institutions to include sustainability and, finally, sustainable entrepreneurship, which aims to find solutions for social and environmental problems through the performance of successful business. Within this set of initiatives, the authors observe that little attention has been given to sustainability and sustainable entrepreneurship as a concept concomitantly integrating the social and environmental aspects. This means that entrepreneurial actions target social, environmental, or even institutional goals in isolation, which have implications for the products and services to be developed. The result is that the demands of a large number of stakeholders, especially those less represented by companies, are often not met. Because there is this variety of ways to refer to sustainable entrepreneurship, which will reflect on different sustainable business conceptions and, consequently, actions in this direction, it is essential to understand the factors that drive entrepreneurs in this direction (Gast; Gundolf, & Cesinger, 2017).

In summary, seen this way, the relevance of qualitative business indicators, the reach of benefits and the groups of stakeholders contemplated (despite their power



conditions in their relationship with the company), and the sustainability measures considered become a reliable scale for entrepreneurial actions for sustainability. All education actions and initiatives for new small businesses should consider these central aspects, but are we moving in this direction? Couldn't this be an opportunity for universities, which for years have been fostering company creation through their incubation programs, to assume a relevant role in this setting? And, despite the role incubators have been assuming, how do the young entrepreneurs who propose to develop projects incorporating sustainability principles and goals position themselves? What place is the new generation of entrepreneurs occupying in this setting?

3. METHODOLOGY

In order to understand how entrepreneurs in university incubators incorporate sustainability into their business plans and the incubator's role in this process, an interpretative qualitative study was conducted (Merriam, 2002). The research data was constructed via semi-structured interviews with the 13 entrepreneurs and the 4 coordinators of the four incubators, two public and two private universities, located in the State of São Paulo. These university incubators were selected because they are a reference to the entrepreneurial stimulus in São Paulo. Table 1 shows the profile of interviewed entrepreneurs.

The interviews were conducted in person, in the incubator environment, recorded in electronic media, and later transcribed in its entirety. Regarding the duration, each interview was around an hour and a half, depending on the interviewee, totaling an average of 26 hours of interviews between coordinators and incubators. The interviews with the incubator coordinators aimed to understand the role that incubators have been playing in forming sustainable businesses. As for the entrepreneurs, they were mostly interviewed about their different conceptions of the meaning of sustainability, the sources of socio-environmental concern found in the researched group's projects, how these principles materialize in business plans, as well as the learning sources and the incubator's role in the process of educating sustainable entrepreneurs.



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COMPANY	POSITION	EXPERTISE	TIME IN POSITION	GENDER	AGE
Ozone Generator	President	Electronic Engineer	8 years	Male	63
Sustainable Solutions	In charge of commercial area	Civil Engineering student	4 months	Male	21
Eco-point	Responsible for site and for advertising	Biological Sciences student	1 year	Male	23
Environmental Textile Consultancy	Managing Partner	Environmental Management	8 months	Female	2
Environmental Consultancy	Chairman	Food Engineering	5 years	Male	36
Environmental Aquatic Consultancy	In charge of administrative and technical area	Oceanography	2 years	Male	28
Environmental Analysis Laboratory	Founding Partner	Biological Sciences and Microbiology doctorate	1 year	Female	34
Solar Energy	Commercial department and projects	Master's in Energy Planning	10 months	Male	27
Fuel Cell	Project development and production	Mechanical Engineer	12 years	Male	62
Ecological Association	Environmental Analyst	Master's in Environmental Engineering	2 years	Female	29
Waste Recovery	Project Coordinator	Language degree	1 year	Female	49
Pest Control	Executive Director	Business Management	3 years	Male	31
Electric Vehicles	Electronic development	Master's in Electronics	10 months	Male	29

Figure 1 - Profile of interviewed entrepreneurs
Source: authors

One can see in Figure 1 that, with the exception of one company, the entrepreneurs do not have business degrees. Another factor that stands out is that the entrepreneurs in most companies belong to a young age group.



Intentionally, incubators were sought that were situated in São Paulo and had companies developing sustainable products and services or with approved business plans, which included socio-environmental goals and principles. Table 1 shows the total projects per incubator and those which were selected for analysis.

Table 1 - Number of projects

INCUBATOR	TOTAL PROJECTS	SELECTED PROJECTS
Public University	107	08
Private Confessional University	08	02
Public University in São Paulo state	11	02
Private University in São Paulo state	08	01

Source: authors

Following the criteria of selection, the research was carried out with thirteen entrepreneurs whose companies had their business plans approved and that incorporate socio-environmental actions, falling within the categories of pre-incubation, incubation, and post-incubation. Interviews were also conducted with the coordinators of the respective incubators, which allowed for the understanding of the existence, scope, and nature of the incubators' efforts to promote socio-environmental actions in the incubated projects. The data was analyzed following the guidelines of Lankshear and Knobel (2004). After transforming the oral data into text, the pieces of information (categories) were organized by thematic similarity, starting from a process of codification and classification of data by discursive similarity and contrasts observed in the speeches. Next, we sought to understand the relationships established by entrepreneurial interviewees between the construction of their business plans and sustainability objectives, interpreting them. The systematic organization of the data into homogeneous groupings allowed analysis of the different meanings of sustainability for the entrepreneurs, the significance that these meanings acquired in the business plan, and how they explain their conducts and entrepreneurial plans. The same can be said of the coordinators, whose analyses focused on the education processes and demands and orientation towards sustainability in the incubators they coordinated. To give reliability to the analyses, the categories were defined by at least two of the researchers separately and then discussed together to verify any discrepancies. Entrepreneurs' speeches and the coordinators' speeches were also analyzed together



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to identify convergences and divergences. The categories were decided *a priori* from the literature and *a posteriori* from the data. In this sense, the categories sought to identify mainly the conception of sustainability entrepreneurship and their drivers (Gast; Gundolf, & Cesinger, 2017), the entrepreneurs' reach of the initiatives (Kuchinke, 2010), whether and how they altered the organizational design (Parrish, 2010; Markman et al., 2016), which sustainability dimensions were considered (Sachs, 1986; Söderbaum, 2008), and the university's role in promoting sustainable entrepreneurship (Cincera et al., 2018). After successive revisions, six thematic axes were selected: a) project selection among the incubators, b) the sources and nature of the incubators' socio-environmental concern, c) the meaning of sustainability for these entrepreneurs, d) how they put these principles into action in their business plans, e) the difficulties and challenges in meeting socio-environmental goals in their companies, f) the incubator's role in fostering sustainable businesses.

After the process of categorization in thematic axes, the analyses were taken considering all information, seeking to answer the two central questions of the investigation, which Lankshesr and Nobel (2004) regarded as the pathway to the whole.

4. PRESENTATION AND ANALYSIS OF RESULTS

The first question investigated relates to **project selection among the incubators**. It was seen that not only are sustainability principles not required during candidate selection procedures, they are also not included among the determining factors for admission, see Figure 2. The exception is the confessional university incubator, which resorts to the criterion as a tiebreaker when there are more project proposals than the incubator can incorporate. The financial dimension continues to be the only eliminating factor. This setting indicates the place that sustainability occupies in the incubators.



Criteria	Confessional Private	Public	Public university in SP state	Private university in SP state
Projects with technological, market and economic viability	✓	✓	✓	✓
CV and profile of compatible candidates		✓	✓	✓
Processes and products cannot be polluting (focus on sustainability)	✓		✓	✓
Degree of innovation in products and services	✓	✓	✓	✓
Potential for interaction with the university		✓	✓	✓

Figure 2 - Project selection criteria

Source: authors

Another question that the study sought to analyze was the sources and nature of the incubators' socio-environmental concerns to understand in what context attention to socio-environmental dimensions and their drivers emerged (Gast; Gundolf, & Cesinger, 2017). Two justifications summarize the reasons for venturing in this field:

- a) Attachment to an ideal, a belief or conviction for acting in favor of sustainability, as illustrated by the excerpt below;

I have always wanted to start a business with environmental projects. So in 2001 I tried to start a selective waste collection, recycling company. I was working at a company and I saw that waste was a problem for this company and it had to pay a company to collect this waste. If you had a company which collected the waste and benefited from it and sold it, you would be earning for this raw material. It would be the best of all worlds. In 2002 I began to study this a bit, I took a month off from the company to study, to draw up my business plan, take part in fairs, visit companies. But I didn't know the market very well yet, and I decided to stay at the company a bit longer, then I went to work at a consultancy called Accenture, where I stayed for a bit more than five years to learn about management of companies and projects. I would always talk with several entrepreneurs, people who also wanted to start something. In 2008, I met two other people. There was a college friend of mine and another friend of his, so three people with the same ideal, which was working with environmental and social programs, that's how the idea came up of starting the company and the environmental compensation program (Entrepreneur from the Environmental Consultancy Company – Public University).

In these cases, entrepreneurs generally seek to affiliate themselves with other like-minded business people to start a business, as the narratives show. The reports also reveal how family background is a source of inspiration for entrepreneurship in sustainability. That is, they were raised in contact with nature or taught by their parents to respect and care about environmental questions. A background in areas linked to



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biological sciences and environmental engineering also helps to understand adherence to this type of project, as does participation in university disciplines that encourage research in this field, such as reverse logistic.

- b) Being anchored in market demands without there being, necessarily, genuine concern with socio-environmental problems.

The idea came up in 2009, more or less, we were doing a master's here at the university. At the time, there were four partners doing a master's, we started talking, doing freelance consultancy, then we decided it would be a good idea to start a business. We thought the setting was quite favorable. A lot of demand is coming up in our area in the environmental sector, and we realized we were competent to enter this market. Working in the market we see a lot of low quality work, and we thought we had a differential (Entrepreneur at the company Environmental Aquatic Consultancy – Public University).

Regardless of the reasons behind the entrepreneurship, analysis of the projects made it possible to identify the sources and nature of these initiatives. Figure 1, below, summarizes the findings:

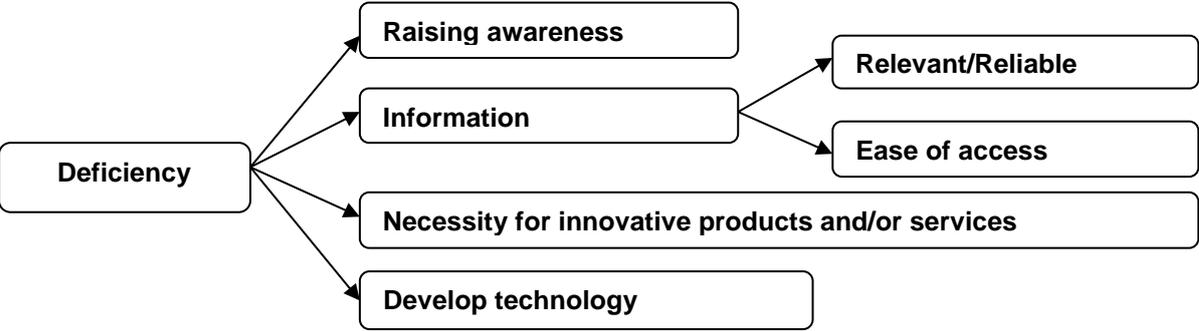


Figure 3 - Source and nature of socio-environmental concerns
Source: authors

As Figure 3 shows, the trigger for entrepreneurship emerged in the discourses linked to the idea of a deficiency, a problem to be resolved, which is above all environmental. This deficiency manifests itself in four fields of action for the entrepreneurs. In two of these – awareness and information – the entrepreneurs intend to offer consultancy and support to inform and bring awareness to people and companies about questions involving sustainability demands. The other two fields – innovative products and/or services and technological development – address technology and specific service needs. It is worth highlighting that the entrepreneurs showed greater concern with responding to a specific market demand; company origin



is seen to be strongly harnessed to a product or technology to be provided and less to an awareness and information service.

However, what is **the meaning of sustainability for these entrepreneurs?** Learning these meanings is relevant as they will be reflected in their actions and explain the nature, scope, and potential of initiatives in the business projects they conduct.

The research participants seemed uncomfortable presenting a clear notion of the term, which was to be expected since it is difficult to define and operationalize (Veeman & Polytilo, 2003). When analyzing their speech, it is possible at first to observe a pattern of response which reproduces both the definition of the Brundtland Report, that is, highlighting the importance of thoughtful natural resource use in order for future generations to be able to enjoy them, and the so-called sustainability tripod, the balance between the environmental, social, and economic dimensions (Elkington, 1998). None of the interviewees referred to other sustainability dimensions, such as the spatial, cultural, political, and institutional ones (Sachs, 1986; Söderbaum, 2008). In addition, despite assuming that sustainability presupposes some consideration of social, environmental and economic aspects, they admit that one dimension is always neglected.

You have to look at the environmental side, the social side too and the economic side, if any one of these projects doesn't have these three currents it won't work and won't be considered sustainability, because nowadays, most have the social and economic part, the environmental part has been neglected (Entrepreneur at the Eco-ponto company – Private Confessional University).

This official discourse, which reveals little about what the expression means to the interviewees, gradually presents other characteristics in the experiences they narrate. Under an umbrella “Sustainability Tripod” concept, three recurring conceptions emerge, in isolation or not, which are summarized in Figure 4: sustainability as a value, a technology, or even a form of conduct.



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Sustainability as Value	Sustainability as Technology	Sustainability as Conduct
<p>Honesty Social Justice Ethics</p>	<p>Develop sustainable products, services and technologies</p>	<p>Be responsible for what you produce; Consider impact; optimize resources Do not hurt the environment; Raise awareness of employees; Raise awareness of population</p>

Figure 4 - Consolidation of the meanings of sustainability emerging in the narratives
Source: authors

It is important to note that sustainability seems to be expressed not only as an idea of conduct, of behavior expected from others or promoted at the company, but also as the content sustaining this idea. For example, in one of the interviews the concept is associated with the activity of raising the awareness of employees, who are to assume the role of multipliers, or even the awareness of third parties, such as the neighborhood. It is as if these two poles, employees and community, excluding the leadership itself, were the only targets of awareness actions.

It's like what we learned in college, there's the Triple Bottom [...] For example, at the factory a lot of water is needed, which has an environmental impact. I correct that, optimize my costs, which is the financial part. And the social part is to raise people's awareness. Within your company, you can show what's important, people can also become aware, employees, the neighborhood. (Entrepreneur at Environmental Textile Consultancy Company – Public University).

In addition, this raising of awareness can serve to reduce environmental impact and costs. They understand awareness as a social dimension of sustainability, which greatly reduces the framework of possible meanings belonging to this dimension. Other entrepreneurs relate sustainability to values such as ethics, honesty, and social justice. In this case, concern is not only with product development and income generation, but also with the ethics that sustain the production process or even the benefits that a given product will bring to society (Kuchinke, 2010).

Sustainability is when you perform something, any activity, any action, any initiative always taking ethics into account. It is also [...] to try in these initiatives to benefit societies or form a fairer and more egalitarian society (Entrepreneur at Environmental Consultancy Company – Public University).



Sustainability also emerges as strongly harnessed to the idea of providing a sustainable and economically-viable service, as illustrated by the excerpt below:

Sustainability to us, our project specifically, means being able to make optimal use of products from non-renewable sources, and this way also providing economy, because it's no use having expensive technology to preserve the environment which isn't economically viable for the company. That's what our idea of sustainability is, protecting the environment, but also giving you the means to use this technology, making it economically viable (Entrepreneur at Waste Recovery Company – Public University).

Considering these ways of thinking about sustainability, it remains to be seen how **they put these principles into practice in their business plans**. Figure 5 synthesizes the main actions reported by the entrepreneurs.

Company/Purpose	Materialization in business plan
Sustainable Solutions Offers a consultancy service for small and medium-sized companies to become sustainable	<ul style="list-style-type: none"> ✓ Sustainable action facilitator ✓ Disseminates importance of sustainable actions ✓ Promotes behavioral change in people and companies ✓ Promotes environmental lectures
Eco-point Dissemination of events and eco-points related to sustainability	<ul style="list-style-type: none"> ✓ Promotes and disseminates events and disposal eco-points ✓ Promotes cultural change in organizations and people's attitudes ✓ Correct disposal of toxic waste ✓ Focus on small businesses ✓ Accessible consultancy for small companies ✓ Change in organization culture
Electric Vehicles Developed, projected and manufactures electric kart which does not emit sound pollution or waste	<ul style="list-style-type: none"> ✓ Creation of electric kart ✓ Non-polluting ✓ Lower energy consumption ✓ Lower sound emission ✓ Reduction of gases harmful to health ✓ Improvement of population health ✓ Sustainable products and accessible prices
Environmental Textile Consultancy Offers a consultancy service in the textile area to promote cleaner production in small and medium-sized companies	<ul style="list-style-type: none"> ✓ Proposes measures to reduce environmental impact; ✓ Focus on small companies (SC) ✓ Price accessible to small companies ✓ Reduces remnant disposal of small confections ✓ Guides, advises, corrects SC actions ✓ Craft recycling ✓ Defibrillates fabric and turns into clothing ✓ Raises employee awareness
Environmental Consultancy Offers a consultancy service including environmental diagnosis, carbon and waste emission management, carbon neutralization	<ul style="list-style-type: none"> ✓ Proposes measures to reduce environmental impact ✓ Reduces waste disposal ✓ Minimizes impact on the environment ✓ Promotes environmental projects in partnership with companies



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<p>Ozone Generator Developed, projected and manufactures system for generating ozone, a powerful germicide</p>	<ul style="list-style-type: none"> ✓ Ozone generation system ✓ Does not use chemicals ✓ Raw material: air ✓ Waste: Oxygen ✓ Does not generate waste; powerful germicide ✓ Kills bacteria, viruses and fungi ✓ Reduces hospital infections ✓ Treats water, food, surgical material ✓ Reduces industry odor, benefits local population
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Figure 5 - Sustainability in business plans
Source: authors

What this data reveals is that the entrepreneurs work towards sustainability as a technological response and/or concern with not impacting the environment. The materialization of actions reflects this logic, which has obvious benefits and limitations. On the one hand, they contribute with adequate responses, especially for environmental problems, on the other hand, they are largely short and medium-reach actions, as they do not encompass all the wealth of possibilities that the sustainability idea-force suggests or sustainable development conception demands (Schaltgger & Wagner, 2011). Besides, many of the initiatives are of a pragmatic character and have little connection with the idea of a company that breaks with the traditional logic of understanding and doing business (Springett, 2005). There is no proposal to change the nature or purpose of what business should be. That is, the question of what type of companies, products, and services interest a sustainable society is not being debated.

This logic becomes even clearer when the interviewees are questioned about the **difficulties and challenges of meeting socio-environmental objectives in their business**. The problems reported by the entrepreneurs refer essentially to the product's market adherence difficulties, and to a lack of awareness and interest in investment or consumption of socio-environmental products and services, whether on behalf of the general public or on behalf of investors and companies. They practically point out obstacles and challenges of a cultural nature unianimously, of market mentality, for which they have few answers. On the one hand, their complaints are legitimate, on the other hand, they indicate that they are not referring to internal problems in their companies, their work partners, their employees or their own business, which contributes to the maintenance of organizational models and designs



(Parrish, 2010; Markman et al., 2016). It is as if only external challenges are at stake, which convinces the market of the importance of their services and products.

You have to break some paradigms, that is, people are used to thinking of karts as a combustion thing (Entrepreneur at Electric Vehicles Company – Public University in São Paulo state).

Selling sustainability is a trial, it's difficult. To what extent can you get people to part with their money (Entrepreneur at Sustainable Solutions Company – Confessional Private University)?

The main challenge is how to generate income at the start [...] (Entrepreneur at Eco-point Company – Confessional Private University).

The main difficulties relate to understanding these projects. What is lacking is company understanding, end consumer understanding (Entrepreneur at Environmental Consultancy Company – Public University).

As it's a service which didn't use to exist, it's difficult for you to win your first clients, change people's habits, make people care about these issues (Entrepreneur at Environmental Textile Consultancy Company – Public University).

They want to be environmentally responsible, but they are not prepared to have a ten-year payback [...] (Entrepreneur at Solar Energy Company – Public University).

The market thinks the environmental question is cool, but it's valued by a very small portion (Pest Control Company – Public University).

This product demands very high investment [...] As our product today isn't a product in a market that's already formed, we need to form the market (Entrepreneur at Fuel Cell Company – Public University).

Our challenge is cultural change, because nowadays there are some ideas that need to be worked on with the market. [...] our challenge is to change the culture (Entrepreneur at Waste Recovery Company – Public University).

However, what is **the incubator's role in fostering sustainable businesses?**

Incubators emphasize a management background. When the entrepreneurs were asked whether there was any encouragement to deal with social and environmental matters in their companies, they unanimously reported the nonexistence of such initiatives in the incubators to which they were connected. Even those that established partnerships with consultancy and support organs, such as SEBRAE (Brazilian Support Service for Micro and Small Businesses) had not received any guidance of this kind, which reveals there is no movement in this direction. On the other hand, the incubators display strong concern with those entrepreneurs who have no management knowledge. They attempt to level the entrepreneurs' backgrounds for their business



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plans to attain better results. Above all, these entities focus their action on creating an encouraging environment for the business to evolve, offering resources that the entrepreneur would not be able to afford on his own.

Every initiative for developing sustainability, when it exists, comes from the entrepreneurs themselves who, through formal or informal learning channels, end up developing themselves in some way. The educational strengths to foster sustainable practices in this context are not being used as they should be (Markman et al., 2016). The incubator coordinators' speeches reaffirm this observation, as in the example below.

At the incubator, we try to help them develop their business, but it's much more difficult to offer training at the incubator because they have very limited time, their schedules are full with running the business [...] So, say a company requires technical training, in I don't know, financial planning, another requires social networks, so we look for these things through our partners, to offer places in courses which are already, let's say, which exist in the market for them. But they're not always able to do the training, that's actually something we're working on, we're studying the best way to do this, sharing experiences with other incubators because... we're measuring now, with indicators (Coordinator at the Confessional Private University Incubator).

Another justification for the lack of investment in education is expressed by the incubator coordinator at the public university in São Paulo state. The limited numbers of people who tend to become involved in these small ventures, along with a level of education which includes students with master's degrees, lead her to consider this type of initiative unnecessary.

Like, if you ask, education, courses, I think it's difficult, why? As you saw here, it's usually two people in companies, they resolve everything, problems with the site, the client, so for you to take a businessman from a company for 4 hours, 3 hours to talk about themes which sometimes are not part of his daily pragmatism, he won't go. [...] It's not possible that a student with a master's degree, or engineering, like, there are things I take for granted that they already know (Coordinator of the Incubator at the Public University in São Paulo state).

Another question, raised by the coordinator of the incubator at the private university in São Paulo state, is the difficulty of meeting all needs due to the incubator's limited staff.



The problem is, it's only six consultants and we're not able to serve everyone the way we should, so the entrepreneur has to chase after consultancies of his own accord (Coordinator at the Private University in São Paulo state).

Even when a support system for the entrepreneur is present, as is the case reported by the public university coordinator, education focuses on performance of market transactions and development of expertise not related to their background. There is no guidance for socio-environmental sustainability matters.

Apart from the advisors we have here full time, for this support, we're seven managers who are here full time. We have some external advisors too who offer this support [...]. I think support is fundamental, especially when we take in researchers who want to transform their ideas into a business, they're very academic, so they need this education to turn them into businesspeople, so we do this routinely (Coordinator at the Public University Incubator).

What can one infer from the reports? From the coordinators' points of view, their lines do not report initiatives to foster the incorporation of sustainability objectives. The concerns of these professionals focus on the difficulties of teaching businesses to the incubated ones that do not come from the Administration area and the lack of resources. Also, only one of the four incubators included sustainability as a criterion for project selection, and even so, this requirement is only used in the event of a tiebreaker in project evaluation when there are more project proposals than the incubator can incorporate. From the point of view of the studied entrepreneurs, there was also no reference to the incubator's action in fomenting their business considering sustainability assumptions. As there was no indication of medium or long-term intention to change their conduct, there is a risk that generations of entrepreneurs who are being received by the incubators in universities will not be necessarily or sufficiently stimulated to advance in socio-environmental purposes, which has obvious consequences. As, Markman et al. (2016) emphasized, there is a responsibility of the institutional strengths to promote such sustainable practices, such as government, social movements, and here we add the role of universities, and more specifically, university business incubators.



4. DISCUSSION

Returning to the study's first central question: *"What does it mean for the new generations of entrepreneurs to incorporate and execute sustainability principles in their business projects at university business incubators?"*, the analyzed data must lead to a conclusion. Although the entrepreneurs reflect in their narratives the need to meet the economic, social, and environmental dimensions that relate to the triple bottom line idea (Elkington, 1998), their actions are not directed at the equilibrium attempt that this logic suggests. The actions of these young entrepreneurs cannot, therefore, be characterized as "sustainable development" as defined by Schaltegger and Wagner (2011). They can be considered social entrepreneurship or eco-entrepreneurism since they exist, above all, in a single dimension. They relate even less to sustainable development if other dimensions of sustainability are considered, such as the spatial, geographical, cultural and justice dimensions, etc. (Sachs, 1986; Söderbaum, 2008). Reference to any of these dimensions in their companies was never made. The entrepreneurs externalized, more than anything, a concern with developing products and services which reduce environmental impact, minimizing natural resource use. Sustainability was associated with an ideal of conduct which values lack of aggression towards the environment and mitigation through sustainable actions, especially those which are environmentally correct. They also strongly associated sustainability with the capacity to develop green technologies, generating innovative solutions. However, the objective of reducing negative impacts on the environment is even stronger in their projects than are mitigation actions, signaling more of a reactive than proactive tendency (Markman et al., 2016).

The social dimension of sustainability, when it appears, comes in the wake of environmental actions, that is, as a consequence of an environmental measure. The entrepreneurs did not mention social impact proposals as a central or primary axis of their companies. Thus, there is a hierarchization of importance and value of each of the sustainability tripod's dimensions, which jeopardizes the notion of equilibrium contained in the sustainability concept. This prioritization given to the entrepreneurs' actions means the emerging companies cannot truly be considered sustainable (Schaltegger & Wagner, 2011).



The entrepreneurs also refer to sustainability as a value, associating it with the idea of ethics, honesty, and the premise that companies are responsible for their actions. But, above all, emphasis is on the offer of goods and services that are considered adequate for the environment. Although this is a laudable effort, it gives little indication that the “sustainable generation” entrepreneurs are reviewing traditional management presuppositions or proposing new business formats (Springett, 2005). There are not even signs of the creation of a new organizational design breaking with traditional principles of entrepreneurship (Parrish, 2010; Markman et al., 2016) nor with the common tasks of conventional entrepreneurship (Schaltegger & Wagner, 2011).

In addition, when questioned about their difficulties advancing towards sustainability, they refer to problems they face, above all, in the adherence of their sustainable products and services. They largely attribute the problems to cultural questions, to the fact that people are not willing to pay for sustainable products. They complain that the prices of these products are not accessible to all social classes and that many companies have no interest in investing in sustainable products and services that won't bring them short-term financial gains. In other words, they present concrete arguments, but which are related only to factors extrinsic to the organization, a fact which may be causing certain immobility.

In any case, there is no doubt that the companies analyzed conducted their business with some consideration given to sustainability aspects. Unfortunately, this does not apply to the set of nascent companies in the context of the four incubators studied, which would have a much greater impact. It is only a case of a few entrepreneurs who incorporate objectives of this nature to their businesses, as this study showed.

When it comes to the second question raised in this research: “*What role do these incubators play in fostering the socio-environmental practices of the new generation of entrepreneurs?*,” the results are not very optimistic either. Investment in education and development in sustainability seemed to be almost nonexistent. These incubators seem to reproduce the logic of entrepreneurship focused only on the economic dimension. The business plan model used as a template for selecting projects and the training provided by the incubator does not lead to a deeper reflection on sustainability. The lack of tools that help entrepreneurs to incorporate sustainability into their business practices lead them to focus their attention only on economic



indicators. A deeper change requires entrepreneurs the ability to critically reflect (Cunliffe, 2016). This means increasing perception of the impacts of their assumptions, values, and actions as a way to develop more responsive and ethical managing practices. Critically reflexive practices can provide a different path for entrepreneurs improving their capacity to manage business in a way that overcomes the prevalent rationale of efficiency and profit. However, the tools that incubators make available to entrepreneurs do not stimulate such thinking. As a result, even those who incorporate sustainability into their business are limited to developing sustainable products rather than creating an organization that can be considered sustainable.

If there is a movement for universities to assume their role in fostering sustainability (UNESCO, 2001; Wright, 2010), both by reviewing pedagogic projects and curricula and in campus management itself, university incubators cannot shirk their participation in this process. If innovation and entrepreneurship have been questioned for their ability to provide answers to socio-environmental problems (Hall, Daneke, & Lenox, 2010), the setting may be even less promising for future generations of entrepreneurs springing from university campuses if those responsible for education do not assume the role of relevant actor (Cincera et al., 2018). A promising start could be both the establishment of the sustainable criteria for approval of the start-ups and a full guideline during his development as a business. Otherwise, we are missing out a huge opportunity in fostering significant transformation.

5. CONCLUSION

Considering the results presented here and what the literature has shown, to what shall we give more attention and efforts? In this education space, entrepreneurs must be provoked to think of sustainability as going beyond the product or service they offer. They must advance in the understanding that entrepreneurship and sustainability are about rethinking values. They must be encouraged to incorporate qualitative evaluation mechanisms. Other parameters must be included in the definition of a successful venture, as well (Parrish, 2010; Springett, 2005; Schaltegger & Wagner; 2011; Markman et al., 2016). Reflection on the reach of their initiatives must be fostered (Kuchinke, 2010; Schaltegger & Wagner; 2011) Finally, distinct dimensions of sustainability must be considered (Söderbaum, 2008; Sachs, 1986). Comparative



studies in other countries and educational contexts should complement this study, even moving beyond considering the following aspects as a possible initial route: the way the business project is selected in the incubators, the sources and nature of the incubators' socio-environmental concerns, the meaning of sustainability for these entrepreneurs, the way they put these principles into action in their business plans, the difficulties and challenges they face in meeting socio-environmental goals in their companies, and, finally, the educational incubator's role in fostering sustainable businesses.

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