E-ISSN: 2469-4339

Management and Economics Research Journal, Vol. 6, Iss. 2, Pgs. 6, 2020

Short Communication

Guidelines for Knowledge Construction in Incubators in the Context of Portugal

Machado

HATASO

Guidelines for Knowledge Construction in Incubators in the Context of Portugal

Andreia de B Machado*
Engineering Department, Vale do Itajaí Mirim College (UNIASSELVI), Brusque - SC, Brazil.

***Correspondence:** abmachadopapers@gmail.com

Received: Mar 6, 2020; Accepted: Apr 17, 2020

Citation: Machado AB. 2020. Guidelines for knowledge construction in incubators in the context of Portugal. Management and Economics Research Journal, 6(2): 990006. https://doi.org/10.18639/MERJ.2020.990006

Abstract

The development of a country can be measured by its ability to innovate. One of the spaces that potentialize the construction of knowledge are the so-called innovation habitats, which are characterized by a great amount of knowledge assets. In this scenario of innovation, incubators stand out as the focus of this study, since they are spaces that potentialize the construction of knowledge. This construction is facilitated by the adoption of a management model. The incubators, known as incubators of ideas, sustain a technology-based enterprise in the early years of its life, and these provide new jobs that generate economic warming. Portugal is a country that is investing in measures to implement policies that promote economic growth. Therefore, the objective of this paper is to propose a model to verify the construction of knowledge in business incubators for generating successful innovative enterprises, systematically and repeatedly leveraging new jobs, and providing solutions to Portugal's economic policy. For such purposes, the methodologies used were the integrative review of the literature using the Scopus database, the analysis of regulations and international and national documents, and data collection from Brazilian and Portuguese incubators. As a result, CELTA (Business Center for Advanced Technologies) is presented—a model for verification of knowledge construction in incubators—that promotes the incubator's ability to prospect and select good ideas in a successful manner and finally turn them into successful and profitable ventures. This model is built around five axes—entrepreneur, capital, management, market, and technology—and 21 guidelines. It can serve as a reference to verify the maturity of knowledge in incubators and other spaces recognized as innovation habitats.

Keywords: Entrepreneurship of base technology; Innovation; Incubator; Guidelines.

1. INTRODUCTION

Innovation permeates current society, which is based on knowledge. It is the ability to use and transform scientific knowledge to improve and/or create new products, processes, or services and also revamp existing ones. It promotes competitiveness and quality, which are needed for the growth of nations (OCDE, 1997).

The capacity to innovate is related to the economic and social growth of the world. External relations of companies are influenced by technology-based[1] entrepreneurship and innovation. It is also noted that economically developed countries disseminate the culture of entrepreneurship and innovation through interactions between universities, companies, and government, three segments considered as agents of innovation. University–industry cooperation and the growth of triple helix relationships involving businesses, universities, and government have progressed. This allows business ecosystems to enhance their

[1] Technology-based entrepreneurship seeks to implement solutions that point to market innovations in the production of a new drug, in the implementation of leadership models, and in the implementation of new software among other things (Bailetti, 2012).

strengths, combine skills, and create diverse applications for newly discovered solutions by sharing their resources and knowledge capabilities with other regions in joint research and development group partnerships, promoting innovative and entrepreneurial systems, developing smart solutions, and promoting business renewal and growth (Ferreira and Teixeira, 2018).

Portugal was one of the countries hit by the subprime[2] crisis that influenced the partnerships between the agents mentioned previously. However, in 2011 (INE[2], 2018), the economy warmed up in Portugal with the investment of €78 billion by the European Central Bank and European Commission. In 2017, the growth was 2.7%, the highest since 2000, the deficit declined to 1.1%, and debt fell to 126% of GDP, with a regrowth in partnerships between universities, companies, and the government.

With the growth of the economy in Portugal, the country has invested heavily in technology-based entrepreneurship, according to the Global Entrepreneurship Monitor (GEM) (2012). Even at the time of crisis in the country's economic, financial, and social situation, entrepreneurship did not diminish. Data collected by GEM also reveal that the Portuguese are more entrepreneurial than their European counterparts. With a high level of entrepreneurship, according to data collected by INE (2012), the mortality rate of newly created companies in Portugal is the highest in the European Union (EU), reaching 70% within 5 years. Corporate mortality depends on the relational dynamics between organizations and their environment (Serrano *et al.*, 2016). According to data collected by INE (2018), 7 out of 10 entrepreneurs see their dream fail in a few years. Therefore, it is fundamental in the first years of life to support new companies with respect to some resources, such as knowledge, capital, infrastructure, and networks.

Situated and applicable knowledge is a resource of companies during the first years of life that generates innovation in entrepreneurial contexts. This knowledge, in turn, generates solutions, solves problems, and, when incorporated into a product or a service, changes, modifies, and results in utility and value (Teece, 2010). In order to keep up with the strong economic competition, it is important to acquire new skills and knowledge, which means increasing the company's capacity to transform learning into a factor of competitiveness. In this context of competitiveness, knowledge becomes a necessary factor for innovations to occur. Thus, the process of innovation is an interactive process, which occurs with the help of several agents that are associated with different types of information and knowledge (Souza, 2014).

For Nonaka and Takeuchi (1997), knowledge is true belief justified, and that is a dynamic process of the human being to justify personal beliefs as part of an aspiration for truth and tacit Knowledge.

Thus, it can be verified that tacit knowledge is based on the subjective knowledge of the human being, an experience difficult to express in words, phrases, numbers, or formulas. This also includes cognitive skills, such as beliefs, images, intuition and mental models, as well as technical skills, such as crafts, among others. Explicit knowledge is that expressed through actions, conversations, and explanations of the human being (Nonaka, 1994).

In an organization, knowledge can be widely constructed and take many forms, but its quality is revealed in the diversity of capabilities the company possesses as a result of that knowledge. Therefore, much of an organization's knowledge has its roots in the expertise and experience of each of its members. The company, in turn, offers a physical, social, and cultural context for the practice and growth of this knowledge to acquire meaning and purpose.

Nonaka (1994) explains that organizations build knowledge continuously, restructuring the synergy of the four fundamental[3] processes of knowledge transformation. In other words, according to the author, organizations are centers of knowledge construction through a process of internalization and externalization.

Knowledge is one of the support mechanisms for entrepreneurs in the initial phase of their business. In addition to knowledge, other resources are also needed. The lack of these resources leads to high mortality rates of companies. Thus, it is crucial to create mechanisms to support entrepreneurs in the initial phase of their enterprise, which is marked by increased vulnerability and uncertainty. This is where business incubators emerge.

[2] INE—*Instituto Nacional de Estatísticas de Portugal* (National Statistics Institute of Portugal). https://www.ine.pt.

[3] The four processes are explained by Nonaka and Takeuchi in the SECI model (socialization, externalization, combination, and internalization).

Incubators aim to incubate an idea, that is, to promote an environment that favors the initial structuring of a business, by providing infrastructure and conditions for the development of technical, managerial, and administrative capacities. Thus, incubators are associated with knowledge-intensive environments, as they provide factors that promote the skills and knowledge necessary to the incubates[4] during the incubation process, thus supporting the future of an enterprise after it graduates further from the incubator stage (Gassmann and Becker, 2006).

The knowledge-building process, which will result in learning, assists in the success of the incubation process. Thus, incubation programs can be seen as learning networks in which the relationships between the incubated and incubated, incubated and incubator, and incubator and incubated may serve to build knowledge, which will lead to learning (Chang *et al.*, 2004, Hadjimanolis and Dickson, 2000).

More recent data collected by the NBIA (2015) show a substantial growth in the number of incubators, estimating the existence of around 7000 companies' incubators worldwide in 2012. In 2018, Lisbon, which has 504,718 inhabitants. had 32 incubators and accelerators, more than 50 spaces of coworking and six Fablabs the same number of the city of São Paulo that has 12.11 million, that is, 24 times superior to that of the Portuguese capital. In Portugal according to RNI (National Network of Incubators 2019) in 2016 there were 121 incubators and in the year 2017, an increase of 14 incubators, that is, 135 incubators.

The resources for the implementation of successful incubators are linked to the incubation program and its operationalization. For the implementation of successful incubators, you need to have some tools such as: support infrastructure, management services to support technological ventures.

To enhance the incubation process, there are some management models for business incubators. In the international scenario, there are approximately 17 of them (Machado *et al.*, 2018). In Brazil, there are two models, namely, the management model of the Genesis Institute in Rio de Janeiro and the CERNE (Center of Reference for Support to New Ventures) Model.

The CERNE model[5], the subject of study of this research paper, aims to create a platform of solutions, in order to expand the incubator's capacity to systematically generate successful innovative enterprises (ANPROTEC[6], 2016). According to this model, the incubator must act in three independent and complementary dimensions: enterprise, process, and incubator (Machado *et al.*, 2018). This management model has demonstrated success in the incubation process and generation of successful technological enterprises.

According to a study carried out in Portugal, there are four incubation models (public–private, institution–financed, venture–capital, and those sponsored by large companies); the incubation process involves the generic incubator model, the incubator technology models, and the incubation models of Grimaldi and Grandi (2005), which propose models for public incubators and for private for-profit incubators. These models are related to the incubation process and not to the management of the incubator. In contrast, this paper has been inspired by the CERNE model of management for incubators, because with the implementation of CERNE, the incubator proceeds to act proactively in the promotion of sustainable development based on innovation. According to Santos and Mendonça (2017), product innovation is the most frequent, followed by the process of transformation into another product or service, with organizational and marketing innovation being less frequent.

The innovation that occurs in the incubators is verified in the products or services that are incubated in the incubators, as these incubate the ideas of the incubated that are installed there. In the incubator, due to the number of processes to be implemented in its management and also due to its complexity, CERNE was structured according to the Incubator Maturity Model, seeking systematically to generate successful ventures. The CERNE model and the SECI model, model proposed by Nonaka (1994) who describe four knowledge conversion processes, which are developed in four ways, and Socialization, Externalization, Combination and Internalization, these cross models provide technical inspiration for the implementation of economic policy solutions in Portugal, which does not indicate companies technological base linked to

[4] In this research, incubated is the entrepreneur who is in the incubation process inside the incubator (Lepeak, 2000).

[5] CERNE is a management model adopted by some incubators with the objective of guaranteeing successful ventures (ANPROTEC, 2016).

[6] *Associação Nacional de Entidades Promotoras de Empreendimentos* (National Association of Entities Promoting Enterprises).

incubators. The objective of this paper is to propose a model for the verification of construction of knowledge in business incubators for the generation of successful innovative enterprises, systematically and repeatedly leveraging new jobs and providing solutions to Portugal's economic policy. How does one propose a model of knowledge construction in incubators for the generation of innovative enterprises that provide solutions to the economic policy of Portugal?

2. ANSWER TO ARTICLE QUESTION

The proposal for a model for building knowledge in incubators for generating innovative ventures that provide solutions to the economic policy of Portugal was called by the author as CELTA, an inspiration from the spiral symbol used by the Celtic people, which means movement and dynamism.

The CELTA model was based on 21 directives and five axes: entrepreneur, technology, market, capital, and management. These axes do not occur in isolation but are integrated by the entrepreneurial axis and intersected by the other axes described subsequently.

- Entrepreneurial axis: It indicates the processes that favor the prospection and development of innovative enterprises. With the promotion and planning of events, plans, models, bank opportunities, talent bank, among others, the number of people interested in the endeavor can be increased with the support of the incubator. This is the integrating axis of the model.
- Technological axis: It indicates the processes with innovative technological solutions for the enterprises to be successful. It has a direct relation with the entrepreneurial axis and also with the other axes.
- Capital axis: It indicates the planning and the creation of actions and models that aim at the financial leverage of the enterprise, guaranteeing the sustainability. It has a direct relation with the entrepreneurial axis and with the other axes.
- Market axis: This refers to the creation of models, strategies, and plans that promote the commercial development of the enterprise. It includes the processes and factors that commercial issues must take into account for the competitiveness of the enterprise, guaranteeing its permanence in the context in which it is inserted. It has a direct relation with the entrepreneurial axis and with the other axes.
- Management axis: This indicates the financial management, resources, infrastructure, people, and technology involved in the development of the enterprise. It aims at processes that transform good ideas into successful businesses, ensuring the implementation of actions that generate quality in the companies supported. It has a direct relation with the entrepreneurial axis and with the other axes.

All axes of the spiral that represents the model are interconnected. The 21 guidelines are integrated to the entrepreneurial axis and intersected with the market, capital, management, and technological axes, thus providing knowledge construction in business incubators, which implies and promotes the incubator's ability to prospect and select good ideas and transform them into successful and profitable enterprises.

3. FINAL CONSIDERATIONS

Portugal is rising economically. This can be observed from large foreign investments in 2018, such as from Adidas, Uber, and Google, thus promoting a high level of internationalization. Thus, the number of incubators and accelerators is increasing, especially in Lisbon, as well as there is significant growth of partnerships between large companies and startups.

In addition, we can compare Portugal and Brazil, where universities, companies, and the government are more than willing to open doors to partnerships with the corporate market. Hence, this paper arises from a problematic situation, that is, as to how to propose a model of knowledge construction in the incubators for the generation of innovative enterprises that imply solutions for the economic policy in Portugal?

To solve this problem, we started with an empirical reflection, where first a search was made for management models in incubators and also knowledge management models. In the world scenario, we have opted for a model that has already been implemented with success in the Brazilian scenario. Thus, in the intersection between these two models and also in the field research carried out in the Brazilian incubators, the CELTA model originated. The model was based on 21 directives and 5 axes: entrepreneur, technological, market, capital, and management.

This model proposes 21 guidelines for verifying the construction of innovative knowledge (knowledge that would have been added to the incubated tools for survival in the competitive market after the incubation period), implying and promoting the incubator's ability to prospect and select good ideas successively, and finally, turn them into successful and profitable ventures.

The objective of this research is for it to become a reference point for discussions and experiences in Portugal so that with this model, it can generate innovative and profitable ventures and thus boost the number of jobs and also increase the expectation of survival of new companies, resulting in growth in the Portuguese scenario.

Since this is a complex topic and entails development in the economic and social scenarios in which the incubator is inserted, this study does not end with the proposition of the CELTA model. We suggest continuity studies dealing with the validation of the CELTA model for practical applicability and for the quantitative verification of the level of maturity of the incubator in the generation of successful ventures in the Portuguese scenario.

Thus, there is a need for continuity studies and research on the part of the incubators and the researchers of this theme so that innovation and knowledge are linked in order to promote local, regional, and national development provided by this innovation and the incubator, both in the economic and nonsocial spheres.

Conflict of Interest

None.

References

ANPROTEC. CERNE. 2016. Centro de Referência para Apoio a Novos Empreendimentos. Available at: http://anprotec.org.br/cerne/ [13th February 2019].

Bailetti T. 2012. Technology Entrepreneurship: Overview, Definition, and Distinctive Aspects. Technology Innovation Management Review 2: 5-12.

Botha A, Kourie D, Snyman R. 2008. Coping with Continuous Change in the Business Environment, Knowledge Management and Knowledge Management Technology. Elsevier: Amsterdam, Netherlands.

Bunge M. 2013. Teoria e realidade. Perspectiva: São Paulo.

Chang PL, Shih C, Hsu CW. 2004. The innovation systems of Taiwan and China: a comparative analysis. Technovation, 529-539. Available at: http://www.sciencedirect.com/science/article/pii/S0166497202001177 [8th January 2019].

Ferreira J, Teixeira AAC. 2018. Open innovation and knowledge for fostering business ecosystems. Journal of Innovation & Knowledge, forthcoming, Elsevier: Amsterdam, Netherlands.

Gassmann O, Becker B. 2006. Towards a resource-based view of corporate incubators. International Journal of Innovation Management 10(1): 19-45. Available at: http://www.academia.edu/18005253/Towards_a_resource-based_view_of_corporate_incubators [5th January 2019].

GEM. 2012. Empreendedorismo no Brasil: relatório executivo: 2014. [s. l.]: FGV; IBQP; Sebrae. Available at: https://www.sebrae.com.br/Sebrae/Portal%20Sebrae/Estudos%20e%20Pesquisas/gem%202014_relat%C3%B3rio%20executivo.pdf [8th July 2019].

Grimaldi R, Grandi A. 2005. Business incubators and new venture creation: an assessment of incubating models. Technovation 25(2): 111-121.

Hadjimanolis A, Dickson K. 2000. Innovation strategies of SMEs in Cyprus, a small developing country. International Small Business Journal. Available at: http://isb.sagepub.com/content/18/4/62.short [8th January 2019].

INE. 2018. Instituto Nacional de Estatísticas de Portugal (National Statistics Institute of Portugal). Available at: https://www.ine.pt

Instituto Nacional de Estatística. 2012. Evolução do Setor Empresarial em Portugal 2004-2010. Instituto Nacional de Estatística, I.P: Lisboa.

Lepeak S. 2000. Incubate this: hatching a dot-com. Available at: https://www.researchgate.net/publication/260807695_Perceptions_on_the_of_use_of_a_corporate_business_incubator_to_enhance_knowledge_management_at_ESKOM [16th January 2019].

NBIA. 2015. National Business Incubation Association. Available at: https://www.inc.com/encyclopedia/national-business-incubation-association-nbia.html [16th January 2019].

Nonaka I. 1994. A dynamic theory of organisational knowledge creation. Organisational Science 5(1): 14-37.

Nonaka I, Takeuchi H. 1997. The Knowledge Creating Company. Oxford University Press: Nova Iorque; 301 p.

OCDE. 1997. Technology incubators: nurturing small firms. Relatório OCDE/GD n. (97)202, Paris, 1997. Available at: http://www.oecd.org/dataoecd/35/11/2101121.pdf [27th February 2016].

Santos AB, Mendonça S. 2017. Open Innovation Adoption in Clusters: The Portuguese Case. The Quadruple Innovation Helix Nexus, [s.l.]. Palgrave Macmillan US; 245-264. http://dx.doi.org/10.1057/978-1-137-55577-9_9

Serrano MM, Neto P, Santos A. 2016. Análise da Eficiência, Eficácia e Mortalidade Empresarial. *Organizações e trabalho* 41-42: 103-120.

Sousa MJ. 2014. Creating a culture of innovation to support key competences development in digital economy. International Journal of Economics, Commerce and Management, India, p. 1-10, 1°. Available at: http://ijecm.co.uk/wpcontent/uploads/2014/09/296.pdf [12th December 2018].

Teece DJ. 2010. Business models, business strategy and innovation. Long Range Planning 43: 172-194.

Yorks L. 2000. The emergence of action learning. Training & Development 54(1): 56.