



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



www.hrmars.com

ISSN: 2222-6990

Business Incubator: The Genesis, Evolution, and Innovation Invigoration

Logaiswari Indiran, Kesavan Nallaluthan, Shathees Baskaran & Bathmavathy Dalayga

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v11-i7/9940>

DOI:10.6007/IJARBSS/v11-i7/9940

Received: 13 May 2021, **Revised:** 19 June 2021, **Accepted:** 30 June 2021

Published Online: 09 July 2021

In-Text Citation: (Indiran et al., 2021)

To Cite this Article: Indiran, L., Nallaluthan, K., Baskaran, S., & Dalayga, B. (2021). Business Incubator: The Genesis, Evolution, and Innovation Invigoration. *International Journal of Academic Research in Business and Social Sciences*, 11(7), 342–354.

Copyright: © 2021 The Author(s)

Published by Human Resource Management Academic Research Society (www.hrmars.com)

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licenses/by/4.0/legalcode>

Vol. 11, No. 7, 2021, Pg. 342 - 354

<http://hrmars.com/index.php/pages/detail/IJARBSS>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at
<http://hrmars.com/index.php/pages/detail/publication-ethics>



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



www.hrmars.com

ISSN: 2222-6990

Business Incubator: The Genesis, Evolution, and Innovation Invigoration

Logaiswari Indiran¹, Kesavan Nallaluthan², Shathees Baskaran³ & Bathmavathy Dalayga⁴

^{1,3}Universiti Teknologi Malaysia, Malaysia, ²Universiti Pendidikan Sultan Idris, Malaysia

⁴Institut Tadbiran Awam Negara Bukit Kiara, Malaysia

Abstract

Global trends and advancements, economic demands, technological revolutions, and challenges are among some of the factors contributing towards the creation of business incubators to nurture fledgling startups to upscale and accelerate their business development. Although it is widely acknowledged that incubation models have changed over the years, yet not many are aware of the value propositions that have been evolved over the past decades. Therefore, this study starts with the genesis of business incubation which was retraced in the 1950s. Thus, by using typology methodology, this study reviews the evolution of business incubators into three phases, namely first generation; economy of scale, second-generation; knowledge-based service, and the third generation; access to external resources, knowledge, and legitimacy. To provide comprehensive data, the methodology used was the integrative review of the literature. This study suggests the incubators' strategy and value proposition should be based on the current trend, challenges, needs, and opportunities in the context of startups.

Keywords: Business Incubators, Genesis, Evolution, Generation, Startups

Introduction

Global trends and advancements, economic demands, technological revolutions, and challenges are among some of the factors contributing to the creation of a competitive and dynamic environment. Such environments are often associated with firms' business development, especially the new start-ups due to their 'newness' and 'smallness'. As globalization affects developing countries and their business developments, several studies have attempted to demonstrate how bottlenecks in trade and finance are being caused by the supply side (Asia SME Finance Monitor, 2014). Therefore, key players from every level like the government, industry, private sector, and others are implicated, especially in terms of economic growth. This has resulted in most small businesses discontinuing their operations within a few years of establishment, which has been attributed to various reasons, such as unmarketable products, financial limitation, poor team performance, inaccurate pricing strategy, and high competition (CBInsight, 2014). For example, 40% of new ventures have been estimated to fail within their first year, whereas a whopping 90% fail over ten years (Timmons and Spinelli, 1994). There is no consensus among scholars regarding actual failure

rates for new ventures, starting a new business is acknowledged as a risky activity due to highly uncertain market temperament and other external environments (Battistella *et al.*, 2017). Such fragile nature has called for an environment that is conducive for new ventures to thrive and increased the opportunities for different government incentives and business assistance mechanisms to improve their survival worldwide (Hong *et al.*, 2016; Ratinho and Henriques, 2010).

This particular line of thought has resulted in advances that call for wide-ranging mechanisms, programs, and incentives, consisting of internal and external resources. Therefore, the establishment of business incubators is necessary to handhold the start-ups, mitigate the risk, and avoid them from falling into the valley of death. Consequently, business incubators especially have emerged as a growing phenomenon around the world by establishing itself as an important tool for encouraging the creation of new businesses, preventing business failures, promoting creativity, and supporting a thriving entrepreneurship sector (Bergek and Norrman, 2008; Aerts *et al.*, 2007; Grimaldi and Grandi, 2005; Bruneel *et al.*, 2012; Jamil *et al.*, 2016; Lalkaka, 2003; Mansano and Pereira, 2016; Ratinho and Henriques, 2010; Scillitoe and Chakrabarti, 2010; Wang *et al.*; 2020). Therefore, it has become a tool most widely utilised in fostering the development of start-up firms during their initial stages. This is in line with its fundamental purpose of nurturing fledgling businesses in surviving and growing during their vulnerable early stages assisting fledgling businesses in surviving and growing during their vulnerable early stages (Caiazza, 2014). Therefore, this study employed a typology methodology to identify the value proposition offered by the business incubator in each generation. The objectives of the study are to explain the business incubator's concept, providing a review of the genesis and development of business incubators based on three generations, and end with the type of business incubators.

Introduction to Business Incubator

The term 'business incubator' is perceived differently depending on the nature and type of incubation. According to UK Business Incubation (UKBI, 2012), it is a combination of wide-ranged business development processes, infrastructure, and people in cultivating small fledgling firms during their early phase. Furthermore, it is also described as an economic tool whose primary objective is to assist in creating new firms in a country. Business incubators in principle are in charge of providing basic physical space, shared equipment, and office services, while also offering various support services. They also supply aid in terms of coaching and mentoring in trade and marketing plan development, building team management, channeling financial assistance, and access to wide-ranging specialized managerial and professional services (Hackett and Dilts, 2004a). Incubators play a critical role in the growth of entrepreneurial cultures and clusters, as well as the development of interconnected business support networks including finance providers, colleges, business schools, major corporations, business practitioners, and government agencies (European Business and Innovation Centres, 2000).

In contrast, Aernoudt (2004) has perceived it differently; as an interactive development process, incubators inspire people to start their own businesses and provide assistance to start-up companies during the production of new products. They can also include services such as hands-on management, access to finance (via seed capital funds or business angels), legal advice, operational know-how, and access to new markets, in addition to lodging. Furthermore, according to Hackett and Diltz (2004a), choosing a shared space facility enables

a business incubator to offer a strategic and value-adding intervention mechanism (i.e. business incubation) to its startups through monitoring and business assistance. This has allowed them the opportunity to maximize resources and utilize the economies of scale.

Studies conducted by European Commission (2002) on incubators have yielded a general framework of operation, defining it as an organization striving to accelerate and systematise the process of starting and running a profitable business. This is accomplished by offering a comprehensive and integrated set of services, such as incubator space, business support services, and clustering and networking opportunities. These efforts are all concentrated on ensuring enterprise growth and development. Moreover, National Business Incubation Association (NBIA, 2007) has surveyed incubation claims and found that graduating start-up firms can sustain and subsequently help and support technology transfer and commercialisation. This has resulted in the regional development among European Union, yielding a summarized definition of Business incubation is described as a set of programmes that help entrepreneurs grow their businesses faster by providing a variety of business support resources and services, which are created or coordinated by incubator management and made available both within the incubator and through its network of contacts. Business incubation is described as a set of programmes that help entrepreneurs grow their businesses faster by providing a variety of business support resources and services, which are created or coordinated by incubator management and made available both within the incubator and through its network of contacts (NBIA, 2007). Despite the lack of literature supporting startups' long-term viability, the concept has suggested incubators' effectiveness in creating entrepreneurial companies. It can be summarised that business incubators tend to supply their startups with various services, allowing benefits to be gained from the utilisation of business support services, infrastructure, and networking (Peters *et al.*, 2004; Bergek and Norrman, 2008; Kiran and Bose, 2020).

Start-up companies are an important dimension in the process of innovation. Therefore, these enterprises are guided by business incubators throughout their growth processes, rendering them an influential instrument in promoting innovation and entrepreneurship (Aerts *et al.*, 2007). Various studies have explored the innovation incubator in support of start-up innovation before resulting in innovation commercialization (Anderson and Al-Mubarak, 2012; Wonglimpiyarat, 2016). Additionally, Nicolopoulou *et al.* (2017) has also reiterated that an incubator's core process is to support the development of incubatee's social innovation. As of recent, Wang *et al.* (2020) Emerging economies should encourage the creation of business incubators to foster the growth of technology entrepreneurs and domestic innovation results, according to the findings.

According to Pauwels *et al.* (2016), a 'one-stop' service model will minimise operating costs by sharing facilities and increase the overall survival and growth prospects of start-ups and small businesses in their early stages. The services provided by an incubator can be divided into five categories:

- i. physical infrastructure,
- ii. office support services,
- iii. access to financial supports,
- iv. process support, and
- v. access to the network.

Hence, in the past two decades, business incubators are organisations that provide a variety of business support tools and services to help entrepreneurs develop and succeed. They are alternatively referred to as business accelerators, seedbeds, industrial parks, science park incubators, networked business incubators, and others in addition to models (Charry, 2014).

The Genesis, Evolution, and Innovation Invigoration

Joseph Mancuso, most notably known as the father of incubators, has first initiated a business incubator in 1958 at a large and unused factory in the Batavia Industrial Centre, New York (NBIA, 2009). Fewer than 100 business incubators can be found in the USA before the 1980s (Lalkaka, 2001). During the post-industrial era, Haugen (1990) has highlighted business incubators as being designed as an economic development tool meant as a way to occupy derelict buildings and reduce the unemployment rate. Such concerns have risen due to suburbanization and large industrial exit from city centres concomitantly. Therefore, the mission and calling of business incubators are towards anchoring the region's economy (Wiggins and Gibson, 2003).

Scholars and industrial organisations alike have expressed their interest in measuring incubation performance. The National Business Incubation Association (NBIA) was established in 1985 in response to the growing interest and dispersion of the incubation phenomenon in the United States, with the aim of encouraging the sharing of incubation practises and policies with the global network of incubators. Initially, the association planned to provide training and tools for newly created incubators, as well as assistance during the early stages of their growth. It has served as a platform for discussion and sharing regarding issues in incubation management, with NBIA actively studying and developing the best practices for incubators to benefit from worldwide.

Nevertheless, several organisations have been developed to assist in the development of standardised and best incubation practises worldwide other than the NBIA. They include the United Kingdom Business Incubation (UKBI) that has been formed in 1998 and the Asian Association of Business Incubation (AABI) established in 2002. Similar to NBIA, AABI is primarily driven towards promoting activities related to company incubation by facilitating information exchange among Asian incubators, incubator tenants, and related organisations; its ultimate goal is to contribute towards increased economic activity in Asia (AABI, 2009). Similarly, UKBI has emphasised its goal of disseminating critical information and best practises in the incubation community, as well as promoting the growth of high-quality business incubation in the UK. Within a decade of its establishment, UKBI has successfully built the country's remarkable infrastructure and incorporated key stakeholders, such as the government and regional development agencies. By 2002, UKBI has reportedly established approximately 250 business incubators compared to the 25 incubators they have initially recorded in 1997. It has demonstrated a favourable atmosphere in assisting business growth in universities, science parks, research and development labs, commercial clusters, and social regeneration programmes, and its exemplary reputation is undeniable to other incubation associations. Following the maturation of its position, UKBI has continued to serve as the national network hub for information sharing, advancing a diverse and knowledge-driven society.

Malaysia has been a member of the National Business Incubator Association (NBIA) since 1998, triggering the creation of the National Incubator Network Association (NINA) in 2004.

It promotes information sharing on incubation and market acceleration among all Malaysian incubators, with the aim of forging collaborative efforts for mutual benefit. NINA's collaboration with a designated technopreneurship agency, Multimedia Development Corporation–Technopreneur Development Flagship (MDeC-TDF) division has consequently facilitated development of technopreneurs and the growth of ICT SMEs to becoming world-class companies (NINA, 2011). The concept of incubation appears to be straightforward, but the implementation of the system is varied depending on different internal and external conditions, policies and procedures, and the goals and objectives of the sponsors and other major stakeholders among different nations.

Due to the burgeoning influencing of business incubators in providing a nurturing environment for start-up firms, scholars have also been investigating the role played by time and global competitiveness that has gone beyond offering added values (Bruneel *et al.*, 2012). Business incubators and their evolution can be classified according to their characteristics into three stages: first generation, second generation, and third-generation (Shepard, 2013). Table 2.1 presents the value proposition of business incubators based on these three different generations. During the first generation, business incubators are required to provide the basic necessity of office space to enable entrepreneurs to initiate their business activities with ease. Meanwhile, the following generation is equipped to supply more developed and tangible services, such as marketing, training, and access to various financial resources. Finally, the third generation has been attributed to improved incubator values via networking services, emphasising preferential access to prospective clients, manufacturers, technological partners, and venture capitalists (Apa *et al.*, 2017; Kiran and Bose, 2020).

Table 1: Business Incubation Value Proposition Based on Generations

Generations of Incubations	Value Proposition/Services Provided	Authors (Year)
First Generation Economy of scale	Physical Infrastructure <ul style="list-style-type: none"> • Office space • Desk • Personal Computer • Telephone, and amenities 	<ul style="list-style-type: none"> • Lalkaka and Bishop (1996) • Allen and McCluskey (1990) • Lalkaka (2001) • Aerts <i>et al.</i> (2007) • McAdam and McAdam (2008) • European Commission (2002)
	Shared Basic Facilities: <ul style="list-style-type: none"> • Personal Computer • Equipment support • Secretary and mail • Security 	
Second Generation Knowledge-based Service	Business Assistance: <ul style="list-style-type: none"> • Management • Personnel recruitment • Business planning • Access to financing aid • Legal and accounting • Advertising • Marketing • Coaching 	<ul style="list-style-type: none"> • Chandra and Chao (2011) • Hansen <i>et al.</i> (2000) • Mian (1997) • Hackett and Dilts (2004b) • Scillitoe and Chakrabarti (2010) • Grimaldi and Grandi (2005) • Wonglimpiyarat (2016)

	Technical assistance: <ul style="list-style-type: none"> • Access to R&D • University research activity and technologies • Research facilities • Link to technology transfer • Technology know-how skills • Research and technology supply • Intellectual property protection 	<ul style="list-style-type: none"> • M'chirgui <i>et al.</i> (2018)
Third Generation Access to external resources, knowledge and legitimacy	Access to technological, and professional: <ul style="list-style-type: none"> • Coaching • Mentoring • Consulting and legal 	<ul style="list-style-type: none"> • Mohd Saffar (2007) • Bollingtoft (2012) • Brunnel <i>et al.</i> (2012) • Shepard (2013) • Apa <i>et al.</i> (2017) • Kiran and Bose (2020)
	Networking access: <ul style="list-style-type: none"> • Key employees • Customers • Suppliers • Collaborators 	

Incubator Model Classifications

Defining business incubators is a difficult process due to their varying configurations. Incubation studies, on the other hand, have delineated the various types of incubators available and then discussed issues related to these incubator types. There is currently no specific definition or form of business incubation (SME Corp, 2012). Despite the fact that business incubation began as a resource-sharing programme, it has developed in terms of functions and characteristics to become an essential tool that provides a variety of services such as training, consulting, and networking (Peters *et al.*, 2004). Many meanings and styles are currently available in the literature, representing facets of national policies and local communities and encompassing a diverse set of programmes, approaches, and goals (Hamdani, 2006; Ratinho and Henriques, 2010; Bollingtoft and Ulhoi, 2005).

Furthermore, Aernoudt (2004) defines an incubator as an umbrella term that encompasses a diverse community of institutions. Some studies have aimed to classify Business Incubators, which has been differentiated according to various dimensions, such as purpose (Bollingtoft and Ulhoi, 2005), ownership structure (i.e. private or public ownership) (Grimaldi and Grandi, 2005), and service portfolio and management features (Aerts *et al.*, 2007). As a result of this heterogeneity, various incubator model classifications have emerged (Grimaldi and Grandi, 2005), which are presented in Table 2.

Table 2: Incubator Model Classifications

Authors (Year)	Classification of Business Incubation
Allen and Rahman (1985)	According to the type of sponsorship as facilities and services provided differ based on sponsors, each having its motivation and objectives
Allen and McCluskey (1990)	Classified into for-profit property development incubators, non-profit development corporation incubators, academic incubators, and business development for-profit seed capital incubators.
Etzkowitz (2002)	Classified into university incubators and network incubators (with internetworking and extra networking)
Peters <i>et al.</i> (2004)	Classified into non-profits focused on diversification in the local economy, for-profits (e.g. private organizations), and university-linked incubators
Grimaldi and Grandi (2005)	Classified into business innovation centres, university business incubators, independent private incubators, and corporate private incubators
NBIA (2007)	Classified into for-profit property development ventures, non-profit development corporations, academic institutions, venture capital firms, and their hybridized variations

The Types of Business Incubators

According to the summary on the Table 2, the main reason for the various forms of sponsorships is attributable to different sponsor reasons, resulting in disparate sets of incubator goals (Colombo and Delmastro, 2002). NBIA (2007) has noted further that incubator's purpose or objectives are another reason for the varying types of incubators. Some are targeted towards developing manufacturing firms, while others are tailored for other industries like agriculture (Zhenhong, 2006), arts and craft (Colombo and Delmastro, 2002), ICT (Abdul Khalid *et al.*, 2014), and biotechnology (Zucker *et al.*, 2002). As the shifting focus to the development of business incubators globally occurs, literature has subsequently concluded that they can be categorised into four types, which are:

- i. public business incubator,
- ii. private business incubator,
- iii. university business incubator, and
- iv. hybrid business incubator.

The government-owned public incubator has acknowledged business incubation as a vital mechanism in enhancing economic and technological advancements, providing a nurturing business environment, and promoting the entrepreneurial idea (Abdul Khalid *et al.*, 2014; Allen and Rahman, 1985; Lalkaka, 2003; Özdemir and Şehitoğlu, 2013). In contrast, privately-owned incubators are formed by private individuals and generate income by charging fees for services provided, sale percentage, and revenues or equity earning. Its primary objective is for-profit generation via new firms (Hansen *et al.*, 2000; Grimaldi and Grandi, 2005). Meanwhile, university incubators are undertaken in or around university campuses, playing key roles in connecting talent, capital, technology, R&D, and the know-how, while also speeding up technology transfer and commercialization (Al Shami *et al.*, 2014;

Rothaermel and Thursby, 2005; Rubin *et al.*, 2015). Finally, hybrid incubators are formed by single individuals or groups with their own purposes, but with the fundamental intention to help start-up businesses in accelerating their business development (Abdul Khalid *et al.*, 2014). An owner of this type of business incubator is basically the possessor of the money in the new start-up firms, holding an equity share. Referred to as accelerators, hybrid incubators are synonymous with only interfering after a business is launched to provide specific professional services in terms of capital or know-how.

The Future of Business Incubation

In today's dynamic and competitive environment, start-ups need systemic and fundamental support to launch, develop, maintain, and achieve their full potential. Recognizing the need and potential of start-ups, incubator programmes have evolved into comprehensive programmes that provide a variety of resources such as physical infrastructure, office support services, financial support, process support, and network access. However, the challenges faced by the incubators are unavoidable, particularly in the digital advancement era where technology changes are faster than humans' mind. Therefore, the purpose of this study is to highlight that the entire business incubator's ecosystem must be addressed to nurture small fledgling firms into innovative and successful businesses. Not only the internal governance structure and resources, but policies and external forces play key roles in bridging the valley of death while shortening the learning curve, which eventually accelerating the performance of the startups and finally promote regional development.

The future business model should be focused on the value proposition provided and it should start with revisiting the related policies and their effectiveness, while creating a systematic and standardised system based on the international best practise, which can be adhered to by all incubator centres. Besides, more correlated external interaction and innovation networking should be facilitated, such as playing role as university-industry intermediaries, linkages to venture capitalist, local and international investors. Nevertheless, learning technological know-how skills is not by counseling interactions, but through external collaboration, including marketing and technology-based relationship should be focussed too. In addition, technological advament has prompt business model towards virtual incubator model. In conclusion, the various stakeholders should play a critical and instrumental role to pipeline the business incubator model towards the growth of startups. Thus, mapping the needs of startups with the current trends, challenges, and opportunities, has its foundation in building a robust strategy in long term.

Contribution of the Study

The review has identified a few developing themes and obstacles in the creation and development of incubation models. Some of the fundamental domains of incubation models have stayed unaltered throughout time, despite technological advancements and dynamic economic shifts. As a result, the elements used in each incubation model have been classified into three major categories: (a) resources, which can be classified into five types: physical, financial, human, organisational, and relational resources, (b) business services, which include coaching and mentoring, consulting, counselling, and financial consulting, and (c) other elements, which include collaboration, affiliation, venture capitalist, mediation, and other services. These categories' aspects can be linked to the performance of business incubators-incubation in the end.

Based on the intrinsic process and important aspects highlighted in each incubation generation, it is demonstrated that the elements are not mutually exclusive among the models, but rather overlap to a degree. Even though the characteristics exist in multiple studies, they have their own unique weight when it comes to evaluating the efficacy of business incubators-incubation performance around the world. Nonetheless, based on the value proposition and services provided in each generation, this study proposes an indicative incubation development in intellectual capital, where the human capital, structural capital and relational capitals are likely to be the centre of incubation process in which it is believed highly would give positive and remarkable contribution in business incubation across all type of business incubators.

Reference

- Abdul Khalid, F., Gilbert, D., and Huq, A. (2012). *Investigating the Underlying Components in Business Incubation Process in Malaysian ICT Incubators*. Asian Journal Of Social Sciences and Humanities Configurations, 1(1), 88–102.
- Aernoudt, R. (2004). *Incubators: Tool for entrepreneurship?* Small Business Economics, 23, 127-135.
- Aerts, K., Matthyssens, P., and Vandenbempt, K. (2007). *Critical Role and Screening Practices of European Business Incubators*. Technovation, 27(5), 254–267.
- Allen, D. N., and McCluskey, R. (1990). *Structure, Policy, Services, and Performance in the Business Incubator Industry*. Entrepreneurship Theory and Practice, 15(2), 61-77.
- Allen, D. N., and Rahman, S. (1985). *Small Business Incubators: A Positive Environment for Entrepreneurship*. Journal of Small Business Management, 23(3), 12-22.
- Al Shami, A., Lotfi, A., Coleman, S., and Dostál, P. (2014). *Unified Knowledge Based Economy Hybrid Forecasting*. Technological Forecasting and Social Change, 91, 107–123.
- Anderson, B. B., and AL-Mubarak, H. (2012). *The Gateway Innovation Center: Exploring Key Elements of Developing a Business Incubator*. World Journal of Entrepreneurship, Management and Sustainable Development, 8(4), 208–216.
- Apa, R., Grandinetti, R., & Sedita, S. R. (2017). *The social and business dimensions of a networked business incubator: the case of H-Farm*. Journal of Small Business and Enterprise Development.
- Asia SME Finance Monitor. (2014). Asia Finance SME Monitor. Manila, Philippines.
- Battistella, C., De Toni, A. F., and Pessot, E. (2017). *Open Accelerators for Start-Ups Success: A Case Study*. European Journal of Innovation Management, 20(1), 80-111.
- Bergek, A., and Norrman, C. (2008). *Incubator Best Practice: A framework*. Technovation, 28(1–2), 20–28
- Bliemel, M., Flores, R., De Klerk, S., and Miles, M .P. (2019), “Accelerators as start-up infrastructure for entrepreneurial clusters”. Entrepreneurship and Regional Development, Vol. 31 Nos 1-2, pp. 133-149
- Bøllingtoft, A. (2012). *The Bottom-up Business Incubator: Leverage to Networking and Cooperation Practices in a Self-generated, Entrepreneurial-enabled Environment*. Technovation, 32(5), 304–315.
- Bøllingtoft, A., and Ulhøi, J. P. (2005). *The networked Business Incubator - Leveraging Entrepreneurial Agency?*. Journal of Business Venturing, 20, 265–290.
- Bruneel, J., Ratinho, T., Clarysse, B., and Groen, A. (2012). *The Evolution of Business Incubators: Comparing Demand and Supply of Business Incubation Services across Different Incubator Generations*. Technovation, 32(2), 110–121.

- Caiazza, R. (2014). Benchmarking of Business Incubators. *Benchmarking: An International Journal*, 21(6), 1062-1069.
- CBInsight. (2014). The Top 20 reasons Startups fail, 1–9. Retrived from: ht Hong, J., Lu, J. (2016). Assessing The Effectiveness of Business Incubators in Fostering SMEs: Evidence from China. *International Journal of Entrepreneurship and Innovation Management*, 20(1-2), 45–60. doi: 10.1504/IJEIM.2016.075298tps://thenextweb.com/insider/2014/09/25/top-20-reasons-startups-fail-report/
- Chandra, A., and Chao, C. A. (2011). Growth and Evolution of High-Technology Business Incubation in China. *Human Systems Management*, 30(1–2), 55–69
- Charry, G. P. (2014). Business Incubator Research: A Review And Future Directions. *Pensamiento & Gestión*, (37), 41-65.
- Colombo, M. G., and Delmastro, M. (2002). How effective are technology incubators?: Evidence from Italy. *Research policy*, 31(7), 1103-1122.
- Etzkowitz, H. (2002). Incubation of Incubators: Innovation as a Triple Helix of University-industry-government Networks. *Science and Public Policy*, 29(2), 115-128.
- European Commission. (2002). *Final report: benchmarking of Business Incubators*. European Commission Enterprise Directorate General (Vol. 51). Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/20657521>
- European Commissions (2002). *Benchmarking of Business Incubators*. European Commission Enterprise Directorate General
- Grimaldi, R., and Grandi, A. (2005). *Business Incubators and New Venture Creation: An Assessment of Incubating Models*. *Technovation*, 25(2), 111-121.
- Hackett, S. M., and Dilts, D. M. (2004a). *A Real Options-driven Theory of Business Incubation*. *The Journal of Technology Transfer*, 29(1), 41–54.
- Hackett, S. M., and Dilts, D. M. (2004b). *A Systematic Review of Business Incubation Research*. *The Journal of Technology Transfer*, 29(1), 55–82.
- Hamdani, D. (2006). *Conceptualizing and Measuring Business Incubation*. Working paper of Science, Innovation and Electronic Information Division. 1(S3), 1–25
- Hansen, M. T., Chesbrough, H. W., Nohria, N., and Sull, D. N. (2000). *Networked Incubators*. *Harvard Business Review*, 78(5), 74–84, 199
- Jamil, F., Ismail, K., Siddique, M., Khan, M. M., Kazi, A. G., and Qureshi, M. I. (2016). *Business Incubators in Asian Developing Countries*. *International Review of Management and Marketing*, 6(4S), 291–295
- Kiran, R., & Bose, S. C. (2020). Stimulating business incubation performance: role of networking, university linkage and facilities. *Technology Analysis & Strategic Management*, 32(12), 1407-1421
- Lalkaka, R. (2001). *Best Practices in Business Incubation: Lessons (yet to be) Learned*. International Conference on Business Centers: Actors for Economic & Social Development. Brussels, November, 14-15.
- Lalkaka, R. (2003). *Technology Business Incubation: Role, Performance, Linkages, Trends*. National Workshop on Technology Parks and Business Incubators, Isfahan, Iran, 20–21
- Lalkaka, R., and Bishop, J. (1996). *Business Incubators in Economic Development: An Initial Assessment in Industrializing Countries*. New York, NY: United Nations Development Programme.

- M'chirgui, Z., Lamine, W., Mian, S., & Fayolle, A. (2018). *University technology commercialization through new venture projects: an assessment of the French regional incubator program*. *The Journal of Technology Transfer*, 43(5), 1142-1160
- Mansano, F. H., and Pereira, M. F. (2016). *Business incubators as support mechanisms for the economic development: Case of Maringá's Technology Incubator*. *International Journal of Innovation*, 4(1), 23
- McAdam, M., and McAdam, R. (2008). *High Tech Start-ups in University Science Park Incubators: The Relationship between the Start-up's Lifecycle Progression and Use of the Incubator's Resources*. *Technovation*, 28(5), 277-290.
- Mian, S. A. (1997). *Assessing and Managing the Univeristy Technology Business Incubator: An Integrative Framework*. *Jornal of Business Venturing* 12(4), 251 - 285.
- Saffar, M. A. (2007). *Asia Regional Workshop Innovation : The Role of Business Incubation Innovation and Entrepreneurship Policy Framework : The Malaysian Experience in Building Sustainable Incubation Industry (Movement)*. Forum American Bar Association
- NBIA. (2007) *The history of incubation*, viewed 8 September 2015 2008. http://www.nbia.org/resource_center/what_is/beginnings_of_inc/index.php
- Nicolopoulou, K., Karataş-Özkan, M., Vas, C., & Nouman, M. (2017). *An incubation perspective on social innovation: the London Hub—a social incubator*. *R&D Management*, 47(3), 368-384
- Ozdemir, O. C., and Sehitoglu, Y. (2013). *Assessing the Impacts of Technology Business Incubators: A Framework for Technology Development Centers in Turkey*. *Procedia-Social and Behavioral Sciences*, 75, 282-291.
- Pauwels, C., Clarysse, B., Wright, M., and Van Hove, J. (2016). *Understanding a New Generation Incubation Model: The Accelerator*. *Technovation*, 50, 13-24.
- Peters, L., Rice, M., and Sundararajan, M. (2004). *The Role of Incubators in the Entrepreneurial Process*. *The Journal of Technology Transfer*, 29(1), 83-91.
- Ratinho, T., and Henriques, E. (2010). *The Role of Science Parks and Business Incubators in Converging Countries: Evidence from Portugal*. *Technovation*, 30(4), 278-290.
- Rothaermel, F. T., and Thursby, M. (2005). *University-incubator Firm Knowledge Flows: Assessing their Impact on Incubator Firm Performance*. *Research Policy*, 34(3), 305-320.
- Scillitoe, J. L., and Chakrabarti, A. K. (2010). *The Role of Incubator Interactions in Assisting New Ventures*. *Technovation*, 30(3), 155-167.
- Shepard, J. M. (2013). *Small Business Incubators in the USA: A Historical Review and Preliminary Research Findings*. *Journal of Knowledge-Based Innovation in China*, 5(3), 213-233.
- SME Corp. (2012). *Study on Enhancing the Effectiveness of Incubation Centres as a Support Mechanism for SME Development in Malaysia*. Putrajaya, Malaysia
- Timmons, J. A., and Spinelli, S. (1994). *New venture creation: Entrepreneurship for the 21st century*: Irwin Homewood, IL
- UKBI. (2012). *About Business Incubation*. Available from: www.ukbi.co.uk/about-ukbi/business-incubation.aspx
- Wang, Z., He, Q., Xia, S., Sarpong, D., Xiong, A., & Maas, G. (2020). *Capacities Of Business Incubator and Regional Innovation Performance*. *Technological Forecasting and Social Change*, 158, 120125
- Wiggins, J., and Gibson, D. V. (2003). *Overview of US Incubators and The Case of the Austin Technology Incubator*. *International Journal of Entrepreneurship and Innovation Management*, 3(1-2), 56-66.

- Wonglimpiyarat, J. (2016). *The Innovation Incubator, University Business Incubator and Technology Transfer Strategy: The Case of Thailand*. *Technology in Society*, 46, 18–27.
- Zhenhong, Q. I. (2006). *Studies on Model Innovation of Agriculture Hi-Tech Business Incubator*. *Science of Science and Management of S&T*, 3, 018
- Zucker, L. G., Darby, M. R., and Armstrong, J. S. (2002). *Commercializing Knowledge: University Science, Knowledge Capture, and Firm Performance in Biotechnology*. *Management Science*, 48(1), 138-153.