

<https://doi.org/10.23913/ride.v14i28.1774>

Scientific articles

Las incubadoras de negocios universitarias: el caso de la incubadora de negocios de la Universidad Autónoma de Baja California

University business incubators: The case of the business incubator of the Autonomous University of Baja California

Incubadoras de empresas universitarias: o caso da incubadora de empresas da Universidade Autônoma da Baixa Califórnia

Edgar Armando Chávez Moreno

Universidad Autónoma de Baja California, México

gared74mx@uabc.edu.mx

<https://orcid.org/0000-0002-9305-3595>

Resumen

Este trabajo de investigación de tipo cualitativo y documental muestra los principales hallazgos sobre la importancia que tienen las incubadoras de negocios universitarias (INU) en el fortalecimiento de las competencias emprendedoras. Este trabajo surgió a partir de una revisión bibliográfica derivada del proyecto de investigación titulado *Las competencias emprendedoras en estudiantes universitarios*, registrado en el departamento de investigación y posgrado de la Universidad Autónoma de Baja California (UABC) durante los ciclos 2022-1 y 2022-2. Entre los hallazgos encontrados, se destaca la importancia de contar con incubadoras de negocios en las universidades que fomenten e incrementen la participación de los estudiantes en emprendimientos que detonen en mejorar las economías locales, según la opinión de diferentes autores, y se documenta el proceso de la incubadora de negocios cimarrones emprendedores (ICEU) de la UABC. Las conclusiones confirman que la implementación de INU contribuye al crecimiento económico y ayuda a fortalecer las competencias emprendedoras en los estudiantes universitarios.

Palabras clave: emprendedores, incubadoras de negocios, competencias emprendedoras, ecosistema emprendedor.

Abstract

This qualitative and documentary research work shows the main findings in relation to the importance of university business incubators in strengthening entrepreneurial skills, based on a bibliographic review derived from the research project entitled "Entrepreneurial skills in university students" registered in the research and postgraduate department of the Autonomous University of Baja California (UABC) during the 2022-1 and 2022-2 cycles. Among the findings found, the importance of having business incubators in universities that encourage and increase the participation of students in ventures that detonate in improving local economies according to the opinion of different authors is highlighted, and the process of the UBI "Cimarrones emprendedores" (ICEU) of the UABC. The conclusions confirm that the implementation of UBI contributes to economic growth and helps to strengthen entrepreneurial skills in university students.

Keywords: entrepreneurs, business incubators, entrepreneurial skills, entrepreneurial ecosystem

Resumo

Este trabalho de pesquisa qualitativa e documental apresenta as principais conclusões sobre a importância das incubadoras de empresas universitárias no fortalecimento das competências empreendedoras, com base em uma revisão bibliográfica derivada do projeto de pesquisa intitulado "Competências empreendedoras em estudantes universitários" inscrito no departamento de pesquisa e pós-graduação da Universidade Autônoma de Baja California (UABC) durante os ciclos 2022-1 e 2022-2. Entre os achados encontrados, destaca-se a importância de existirem incubadoras de empresas nas universidades que estimulem e aumentem a participação dos alunos em empreendimentos que detonem na melhoria das economias locais segundo a opinião de diversos autores, e o processo da UBI "Cimarrones emprendedores" (ICEU) da UABC. As conclusões confirmam que a implementação do UBI contribui para o crescimento económico e ajuda a fortalecer as competências empreendedoras nos estudantes universitários.

Palavras-chave: emprendedores, incubadoras de empresas, habilidades empreendedoras, ecosistema emprendedor.

Fecha Recepción: Enero 2023

Fecha Aceptación: Enero 2024

Introduction

The importance of supporting ventures through business incubators is highlighted in numerous recent studies (Alsaad, 2021; Barajas, 2022; Chan *et al.*, 2022; Leitão *et al.*, 2022; Moreno, 2021; Muslim, 2021; Pacheco, 2021; Palomera, 2022; Rodríguez, 2021; Tang *et al.*, 2021; Torres, 2021; Vargas *et al.*, 2021), which emphasize the contribution to the economic boost of the entrepreneurial ecosystem at a global level, which is why, increasingly, universities implement university business incubators to support students who decide to start a business.

Therefore, the objective of this study is to identify some concepts of business incubators, university business incubators, business incubators in Latin America, university business incubators in the world and entrepreneurial maroon university business incubators of the Autonomous University of Baja California, for which the following questions were taken into account: What is a business incubator? What is a university business incubator? What are the main business incubators in Latin America? What are the main university business incubators in the world? What is the scope of the entrepreneurial maroon university business incubator of the Autonomous University of Baja California?

In his search for answers about the situation of university business incubators (UBI) in Latin America, Barajas (2022) discovered in his study that Mexico and Brazil were the first countries to seriously promote business incubators in the 1990s (Lagunes, 2014, cited by Barajas, 2022).

On the other hand, BBVA (2017, cited by Barajas, 2022), one of the largest banks worldwide that provides financial support to both entrepreneurs and large companies, mentions the main incubators in Latin America (table 1).

Table 1. Main Latin American business incubators

Country	Name	Website	Main features	Start year	Years' operating
Argentina	NXTP Labs	https://www.nxtp.co/	Focused on business systems, <i>marketing</i> and growth strategy	2011	eleven
Brazil	Genesis Institute	http://www.genesis.puc-rio.br/lang/espanhol/	Oriented to the youth entrepreneurship sector	1997	25
Chili	Startup – Chile	https://startupchile.org/	Works with public funds from the government	2010	12
	Incubate UC	https://centrodeinnovacion.uc.cl/incuba-uc/	Located in the top 25 of the UBI 2019 world <i>ranking</i>	2014	8
Colombia	iNNpuls	https://www.innpulsacolombia.com/	Aligned with the 2020 entrepreneurship bill	2012	10
Mexico	Pool	https://www.thepool.mx/about	Financial education and focused on young entrepreneurs	2013	9
Uruguay	Ingenuity	https://ingenio.org.uy/	Technology-based university projects	2001	twenty-one

Source: Own elaboration based on BBVA (2017, cited by Barajas, 2022)

Globally, according to the UBI Global Ranking 2019, the top 20 university business incubators in the world are shown in alphabetical order in the following list:

1. Auge UCR (Costa Rica) began operations in 2012: <https://augeucr.com/>
2. Centech (Canada) began operations in 1996: <https://centech.co/en/>
3. Chalmers Ventures (Sweden) began operations in 1999: <https://chalmersventures.com/>
4. The DMZ (Canada) began operations in 2010: <https://dmz.ryerson.ca/>
5. GU Ventures (Sweden) began operations in 1995: <https://www.guventures.com/incubator>
6. Incuba UdeC (Chile) began operations in 2001: <https://www.incubaudec.cl/>

7. Campus Nova Incubator (Colombia) began operations in 2018:
<https://www.javeriana.edu.co/web/innovacion-emprendimiento/emprendimiento>
8. INITS Universitares Grunderservice Wien GmbH (Austria) began operations in 2002:
<https://www.inits.at/>
9. IPN Incubadora (Portugal) began operations in 2002: <https://www.ipn.pt/incubadora>
10. ITU Cekirdek (Turkey) started operations in 2011: <https://itucekirdek.com/>
11. McGill Dobson Center for Entrepreneurship (Canada) began operations in 1988:
<https://www.mcgill.ca/dobson/>
12. PoliHub – Innovation Distric & Startup (Italy) began operations in 2014:
<https://www.polihub.it/en/>
13. Incubator Network of the University of the Valley of Mexico (Mexico) began operations in 2007: <https://uvm.mx/incubadora-uvm>
14. The SETsquared Partnership (UK) began operations in 2002:
<https://www.setsquared.co.uk/>
15. Studio G at Arrowhead Center (United States) began operations in 2004:
<https://arrowheadcenter.org/program/studio-g/>
16. SUPERA Parque de Inovacao e Tecnologia (Brazil) began operations in 2003:
<https://en.superaparque.com.br/>
17. TEC Edmonton (Canada) ceased operations in June 2021.
18. University of Toronto Entrepreneurship (Canada) began operations in 2009:
<https://entrepreneurs.utoronto.ca/>
19. Utrechtinc (Netherlands) started operations in 2009: <https://utrechtinc.nl/>
20. YES!Delft (Netherlands) began operations in 2005: <https://www.yesdelft.com/>

Adhana and Kumar (2020) highlight that the government of countries like India has implemented various actions and initiatives with the main objective of strengthening entrepreneurial skills in young people. Some of these programs are Startup India, Mentor India and Atal Innovation Mission. As a result of these initiatives, an increase in *startup* success stories has been observed, as well as a strengthening of the entrepreneurial ecosystem through business incubators. For their part, Ali *et al.* (2022) highlight the relevance of establishing UBI to strengthen entrepreneurial skills in university students.

On the other hand, during the 2021-2 semester, the decision was made to register the research project *Entrepreneurial skills in university students* with the research and postgraduate department of the Autonomous University of Baja California. This project was developed during

the 2022-1 and 2022-2 semesters, in collaboration with the University of Costa Rica. During the documentary research of this study, it was discovered that UBI are a crucial ally to strengthen entrepreneurial skills. Therefore, in addition to presenting the results found in the bibliographic review, the way in which the UABC Cimarrones Emprendedores business incubator operates is documented, as detailed in the following paragraphs.

Business incubators

Considering the relevance of business incubators in the global economy, it is necessary to highlight that the first business incubator in the United States emerged in 1959 in Batavia, New York (Tang *et al.*, 2021). According to Ayodele *et al.* (2019), these incubators have played a fundamental role in the growth and innovation of some developing countries. In this regard, Razo (2020) points out that a strategy commonly used by governments to promote entrepreneurship is the creation of business incubators. But what is meant by a business incubator? To answer this question, below are 24 definitions compiled from an exhaustive documentary review:

1. A business incubator provides services and support to business units either through a work space, legal advice, guidance, training, as well as startup capital (Ali *et al.*, 2022).
2. It is an independent business unit that helps industrial development and service projects in their initial stages (birth and emerging stages) to contribute to their growth, sustainability and continuous improvement, through administrative training, marketing, as well as obtaining financing (Alsaad, 2021)
3. Business incubators have the objective of accompanying the start of ventures, particularly those that are technologically based or with a high degree of innovation (Guerra, 2015, cited by Álvarez *et al.*, 2019).
4. Business incubators are defined as well-defined organizations with administrative centers focused on business acceleration through shared knowledge and resources (Phan, 2005, cited by Audretsch and Belitski, 2019).
5. Business incubators are a specific form of organization that aims to develop associated business clusters (Ayodele *et al.*, 2019).
6. It is a shared office space that seeks to provide its incubates with a strategic intervention system that adds business monitoring and assistance value. This system controls and links resources with the objective of facilitating the successful development of new companies from those incubated and, at the same time, containing the cost of their possible failure (Hackett and Dilts, 2004, cited by Dee *et al.*, 2013).

7. The business incubator is a dynamic business development and support process that accelerates the successful development of a *startup* by providing entrepreneurs with specific resources usually developed by the business incubator manager through the network of contacts (National Business Incubators Association, 2014, cited by Hassan, 2020).
8. They are organizations designed to accelerate growth and promote the success of ventures, through economic and logistical resources such as facilitation of physical spaces, investments, *coaching* or access to contact networks (Herazo, 2019).
9. The main objective is to provide support to *startups* to overcome typical business challenges of financial types, space rental, human resources, market access, as well as the development of entrepreneurial skills (Rathore and Agrawal, 2020, cited by Hewitt and van Rensburg, 2020).
10. Business incubators are alternatives designed to create a protective environment for the creation and implementation of new companies (Janqui, 2020).
11. A business incubator is tangible shared value-added resources, such as office facilities, university laboratories, infrastructure and financial subsidies, as well as intangible resources, such as knowledge that facilitate the development of a new business with support for value-added strategic intervention., monitoring system, business and technological assistance (Gassmann and Becker, 2006, and Caiazza, 2014, cited by Kiani *et al.*, 2019).
12. Business incubators are drivers of job creation and therefore regional economic development as they offer various facilities ranging from office space, capital, management support and knowledge. There are different types of business incubators depending on the variety, stakeholders, sponsors, location, objectives and services offered. Business incubators constitute an important dimension in the innovation system and have become part of modern entrepreneurship ecosystems (Leitão *et al.*, 2022).
13. Business incubation is one of the most effective strategies to promote community entrepreneurship, to support job creation by supporting new businesses and encouraging the diversification of business opportunities. It stimulates growth and acts as an agent, revitalizes rural or impoverished areas and promotes the transition to their own businesses of students and workers seeking new professional paths. Business incubators can focus on business spaces with multiple and low-cost business services to help entrepreneurs in the early stages of business development (Mahmood *et al.*, 2016, cited by Li *et al.*, 2020).

14. A business incubator is a shared office space that seeks to provide its incubates with a strategy, a value-added system for monitoring, and business services. Its purpose is to provide the necessary resources to incubate a new business idea towards a level of business maturation (Sherman and Chappell, 1998, cited by Lyken *et al.*, 2020).
15. It is an institutional platform that is created with the purpose of promoting the creation of companies (Stevenson, 1996, cited by Mayer *et al.*, 2020).
16. Business incubators are an effective tool in the economic development process of developing countries. These play a fundamental role in business ideas and projects (Al-Wadi, 2010, cited by Muslim, 2021).
17. Business incubators are organizations that support the growth of new businesses by providing tangible resources such as spaces, equipment and administrative services, as well as intangible resources such as knowledge, network of contacts, during a flexible period through their own funds or external economic resources. by the government or organizations (Hausberg and Korreck (2018, cited by Nicholls *et al.*, 2018).
18. Business incubators are programs designed to successfully accelerate the development of entrepreneurs' business ideas through a set of business resources and services. The main objective of a business incubator is to encourage the development of a new local business (Ramar and Muthukumaran, 2019).
19. Incubators are tools to promote the birth of companies, as they provide them with the necessary assistance to develop (Rodríguez, 2021).
20. In general terms, a business incubator is a physical space that provides a series of specific services to an individual company or small businesses. This includes physical office spaces, flexible rents, access to technology, financing, technical advice in marketing, law, finance, human resources and other administrative services (Sanyal and Hisam, 2018).
21. The concept of a business incubator is related to the existence of an organization that provides an innovative environment that includes instruments, resources, services and collaboration networks. It organizes the market environment to support the generation of new businesses through a system that accelerates their creation, growth and consolidation (Stradi, 2019).
22. A business incubator is a simulation of a small business made up of entrepreneurship, capital, administrative, infrastructure and physical spaces close to the market, industry and policies to develop new business ideas, stimulating local economic growth (Hubies, 2009, cited by Sudana *et al.*, 2019).

23. Business incubators are catalysts for knowledge transfer, innovation and commercialization by providing office spaces, equipment, mentoring services, venture capital, as well as other administrative support services to entrepreneurs (Hillemane et al., 2019, cited by Wang *et al.*, 2020).
24. A business incubator is an institution where entrepreneurs can find help and professional knowledge to create business plans and develop business strategies for companies, as well as find innovative solutions related to the implementation of new technologies (Wang and Li, 2011, Chiara, 2014, cited by Wolniak *et al.*, 2019).

Based on the above, the following paragraphs explain the concept of university business incubators and their importance not only in the entrepreneurial ecosystem, but also in strengthening entrepreneurial competencies or skills in university students.

University business incubators (UBI)

Gutiérrez and Rafael (2012, cited by Aliaga *et al.*, 2019) highlight the importance of promoting the creation of spaces such as business incubators within universities with the purpose of strengthening entrepreneurial skills in university students (Padilla and Urbizo, 2020). According to Todorovic and Suntornpithug (2008, cited by Aliaga *et al.*, 2019), a university business incubator (UBI) is based on incubation programs established by the university itself to support new companies. generated by students and, sometimes, by individuals external to the institution to contribute to improving the business quality of those involved.

Recent research (Gaona *et al.*, 2020) indicates that the main challenges that university students face when entrepreneurship are related to economic investment and low sales of their products and/or services. Likewise, they point out that the fundamental support they require to carry out their ventures is linked to marketing issues, financial advice and business training, aspects that can be effectively addressed through an UBI. In this sense, it is recommended that higher education institutions not limit themselves to establishing UBI on their campuses, but also train all members of the university community in entrepreneurship issues. Furthermore, the transversal integration of entrepreneurship in the study plans of educational programs is suggested and the promotion of entrepreneurial culture in the university community through contests, forums, conferences, among others, with the purpose of transforming the mentality of university students and motivating them. to go from being employees to becoming employers.

Gorączkowska (2020) mentions in her study that UBI, although they contribute in a more limited way to the generation of innovations compared to technological incubators, play a crucial

role in the creation of new companies within university campuses. On the other hand, Guerrero *et al.* (2020) point out that, although universities have traditionally equipped their students with tools and skills to secure employment, they are currently evolving towards the formation of an entrepreneurial ecosystem that offers various employability options, such as self-employment, academic entrepreneurship or intrapreneurship.

However, despite the relevance highlighted in previous studies on the importance of establishing business incubators to boost economic development globally, especially in developing countries, other studies (Lukeš *et al.*, 2019) suggest that they do not. There is sufficient evidence to infer that the implementation of business incubators is an efficient tool to trigger the creation of jobs and wealth. In this sense, Ensley and Hmieleski (2005) and Dvouletý *et al.* (2018)—cited by Lukeš *et al.* (2019)—underline the need to continue investigating the relationship between the implementation of business incubators and the success of entrepreneurship. Furthermore, it is essential to examine the connection between UBI and the strengthening of entrepreneurial skills (Mayer *et al.*, 2019; Osiobe and Winingham, 2020; Rakthai *et al.*, 2019; Rodríguez and Figueroa, 2019; Stal *et al.*, 2016; Williams *et al.*, 2019; Zotov *et al.*, 2019).

In the case of Mexico, Mayer *et al.* (2019) explain that there is currently a growing need to promote entrepreneurial culture in HEIs in order to strengthen entrepreneurship skills in university students. This will provide opportunities for graduates to face the challenges that arise upon completing their studies, such as entering the labor market and low salaries, among other obstacles. Furthermore, Stradi (2018) suggests that one way to increase the participation of university students in the incubation of their business ideas is by implementing a remote UBI model, taking advantage of the current ICT momentum.

With the above explained, the operation of the UABC Cimarrones Emprendedores business incubator is described below, the result of the research carried out during the 2022-1 and 2022-2 semesters, which culminated in a virtual research stay through the Intercontinental Online Education Research Network.

UABC Cimarrones Entrepreneurs Business Incubator

In 2009, the Entrepreneur Help Center (Padilla, 2017) emerged, adopting the Empreser methodology at the Autonomous University of Baja California (UABC). This center later evolved towards the creation of the university business incubator called Cimarrones Emprendedores, which operates as an internal body with the fundamental mission of offering free advice, training and coaching to newly created micro, small and medium-sized businesses. In addition, it has



established service offices located in the university units of Mexicali, Tijuana, Ensenada and San Quintín.

According to the Autonomous University of Baja California (2022), the Cimarrones Entrepreneurs UABC (ICEU) incubator:

It is a business incubation program that promotes entrepreneurship and also provides advice and training to entrepreneurs of newly created micro, small and medium-sized companies, with the aim of providing them with the necessary tools to generate competitive companies (para. 1).

The objective of the ICEU according to the Autonomous University of Baja California (2022) is:

Promote entrepreneurial culture in the university community, supporting students in their initiative, transforming their project vision into a formally realized company. Offer a planning model that facilitates the implementation, development and consolidation of businesses. Coupled with the training of successful entrepreneurs and students, with skills and values that contribute to economic growth. Favor and promote the birth of a new generation of young entrepreneurs and provide controlled conditions for the birth and growth of a new company (para. 2).

The mission of the ICEU, according to the Autonomous University of Baja California (2022), is:

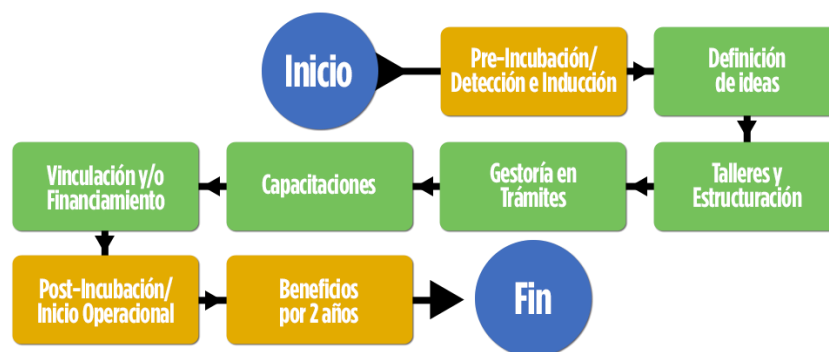
Cimarrones-Entrepreneurs, from the Autonomous University of Baja California, promotes the creation and growth of micro, small and medium-sized businesses, through the training of successful entrepreneurs, who contribute to the economic development and competitiveness of the region (para. 3).

The vision of the ICEU, according to the Autonomous University of Baja California (2022), is:

Be leaders in the incubation of successful companies that allow the formation of productive environments with social responsibility, dynamic and competitive to improve the economic development of the country (para. 3).

In relation to the support provided by the University Business Incubator (ICEU), the following stand out: Business Model Development Program, Executive Summary, Financial Projection and Start-up Plan. Likewise, business training is offered that includes topics such as marketing, taxation, legal aspects, innovation and creativity, administration, among others. In addition, advice is provided and the link to financing options is facilitated, whether by the federal or state government, or through banking and financial institutions. Figure 1 shows the incubation process.

Figure 1. ICEU incubation process



Source: Autonomous University of Baja California (2022)

On the other hand, regarding the achievements of the ICEU incubator (Autonomous University of Baja California, 2018), in 2017 alone, 133 companies were incubated that generated 149 new jobs. The amount linked for financing amounted to \$750,000 pesos, and it is worth noting that in the state of Baja California this incubator was one of the 4 recognized by the defunct National Entrepreneur Institute.

Methodology

This work constitutes a qualitative and descriptive study, carried out from a research project titled *Entrepreneurial competencies in university students*, registered in the research and postgraduate department of the Autonomous University of Baja California during the 2022-1 semesters. and 2022-2. To carry it out, the documentary research method was used (Reyes and Carmona, 2020), starting from the objective of identifying the concepts related to business incubators, university business incubators, business incubators in Latin America, university business incubators in the world. and the university business incubator Cimarrones Emprendedores of the Autonomous University of Baja California.

This approach allowed us to address the following research questions: What is a business incubator? What is a university business incubator? What are the main business incubators in Latin America? What are the main university business incubators in the world? What is the reach of the Cimarrones Emprendedores university business incubator of the Autonomous University of Baja California? This, in turn, facilitated the presentation of the benefits associated with the implementation of university business incubators in strengthening the entrepreneurial skills of students.

Results

Based on the documentary analysis carried out, it was found that worldwide the implementation of business incubators that support the strengthening of the entrepreneurial ecosystem has increased. To better understand the importance of this body, the main business incubator concepts found are mentioned below:

Concept 1: A business incubator provides services and support to business units either through a workspace, legal advice, guidance, training, as well as startup capital (Ali *et al.*, 2022).

Concept 2: Business incubators are drivers of job creation and therefore regional economic development as they offer various facilities ranging from office space, capital, management support and knowledge. There are different types of business incubators depending on the variety, stakeholders, sponsors, location, objectives and services offered. Business incubators constitute an important dimension in the innovation system and have become part of modern entrepreneurship ecosystems (Leitão *et al.*, 2022).

Concept 3: “It is an institution dedicated to creating, promoting and consolidating business ideas and projects through the assistance, advice and consulting necessary for entrepreneurs for the mechanisms of access to all the tools and knowledge to start a business, promoting its success and sustainability” (Palomera, 2022, p. 6).

Concept 4: The concept of a business incubator is related to the existence of an organization that provides an innovative environment that includes instruments, resources, services and collaboration networks. It organizes the market environment to support the generation of new businesses through a system that accelerates their creation, growth and consolidation (Stradi, 2019).

Concept 5: “They are organizations that can be both governmental and private in nature that encourage the creation of new companies through training and business advisory processes and provide the basic elements for the creation and development of new companies, their objective is to contribute to the business development of the State since it reduces the risks of business closures” (Alba, 2018 cited by Torres, 2021, p. 48).

Concept 6: “Business incubators grow young companies through external support, whether technical or financial. It is a useful tool for the creation of new companies and is usually sponsored, supported and operated by private, governmental or university entities, providing support in technical and financial services. (Guerra *et al.*, 2015, cited by Vargas *et al.*, 2021, p. 205).

Concept 7: Business incubators are organizations whose purpose is to support new companies, providing a series of resources, as well as services. Providing assistance in the first

years of life to ventures, since at this stage they are most vulnerable. If the companies that are incubated are successful, this leads to economic growth, job creation and, in general, the well-being of the people (ECLAC and WIPO, 2003, Bóveda *et al.*, 2015, cited by Vera *et al.*, 2020).

Concept 8: Business incubators are catalysts for knowledge transfer, innovation and commercialization by providing office spaces, equipment, mentoring services, venture capital, as well as other administrative support services, to entrepreneurs (Hillemane *et al.*, 2019, cited by Wang, *et al.*, 2020).

Concept 9: A business incubator is an institution where entrepreneurs can find help and professional knowledge to create business plans and develop business strategies for companies, as well as find innovative solutions related to the implementation of new technologies (Wang and Li, 2011, Chiara, 2014, cited by Wolniak *et al.*, 2019).

On the other hand, for the purposes of this study, it was possible to identify that, among the types of business incubators, the UBI is one of the concepts of greatest interest. A comprehensive definition is presented below. According to Todorovic and Suntornpithug (2008, cited by Aliaga *et al.*, 2019), an UBI is based on incubation programs established by the university itself with the objective of assisting new companies generated by students and, sometimes, by external individuals. to the institution, which contributes to improving business quality through the participation of those involved in the incubation process.

An interesting finding derived from documentary research on UBI and their impact on the entrepreneurial skills of university students is that, according to Gaona *et al.* (2020), the main obstacles that students face when starting a business are linked to economic investment and low sales of their products and/or services.

On the other hand, the main support they require to carry out their venture is related to aspects of marketing, financial advice and business training, which can be addressed through an UBI.

Additionally, it was discovered that the Autonomous University of Baja California has the Cimarrones Entrepreneurial Business Incubator (ICEU), which offers a series of services that are demanded by every entrepreneur, especially by university students.

Discussion

From the results obtained in this documentary research, it is evident that more and more countries are directing their efforts towards promoting an entrepreneurial culture. According to different authors, it is imperative to continue investigating the relationship between UBI and the strengthening of entrepreneurial skills in university students, as pointed out by Mayer *et al.* (2019); Osiobe and Winingham (2020); Rakthai *et al.* (2019); Rodríguez and Figueroa (2019); Stal *et al.* (2016); Williams *et al.* (2019); Zotov *et al.* (2019).

On the other hand, some limitations that this research faced include the absence of studies that measure the relationship between the existence of an UBI at the Autonomous University of Baja California and its impact on strengthening the entrepreneurial skills of students. Another limitation is the temporality of this study, which covered the 2022-1 and 2022-2 semesters.

The strengths of this study were manifested in the abundance of information available, which incorporated studies from countries on all five continents. These studies coincide in the research and implementation of business incubators, as well as in the key functions, supports and services that these organizations offer to new entrepreneurs. UBI presence is highlighted as vital to boosting economic development.

The study, in short, fulfilled its objective of identifying the concepts related to business incubators, university business incubators, main business incubators in Latin America, main university business incubators in the world, and the Cimarrones Emprendedores university business incubator. the Autonomous University of Baja California.

Even so, due to the time limitation to carry out the study, it was not possible to carry out a parallel investigation to measure the influence that the UBI ICEU has on the university students of the Autonomous University of Baja California, nor to carry out a comparative study between the profiles of the different educational programs within the university.

Conclusions

Carrying out this study allowed us to identify worldwide uniformity regarding the concept of business incubators. It was found that the main support activities carried out by these organizations to promote new businesses are related to financial advice, administrative activities, marketing, business plan, mentoring, training and coaching, physical office spaces, contact networks, infrastructure, among others. A convergence was also highlighted in the studies around the importance of establishing UBI to promote innovations in the local environment, which

contributes to economic development and the strengthening of the entrepreneurial ecosystem, as well as the development of entrepreneurial skills in university students.

Another relevant finding is related to the obstacles that entrepreneurs face when starting a business, especially young university students, such as financial investment and low sales of their products and/or services. In addition, the main supports necessary to carry out a venture and reduce the probability of failure were identified, which are linked to marketing issues, financial advice and business training. Coincidentally, these challenges can be addressed through an UBI.

However, although the Autonomous University of Baja California has a business incubator, to date no studies have been carried out that measure the effectiveness of the UABC Cimarrones Entrepreneurs University Business Incubator (ICEU) in relation to the strengthening the entrepreneurial skills of their students. Furthermore, the generation, growth and maturation of businesses that contribute to regional economic development have not been evaluated. It is crucial to highlight that, given the evolution of ICT, it is imperative to adapt the incubator towards a distance service to extend the benefits of incubation to a broader spectrum of university students.

Future lines of research

The possibility of undertaking future research work is raised to evaluate the performance of the Cimarrones Entrepreneurs University Business Incubator (ICEU) of the Autonomous University of Baja California and its impact on the formation of entrepreneurial skills among students. This analysis could be extended to the review of other indicators associated with innovation and economic development. Likewise, it would be interesting to carry out a comparative study between UBI not only in Mexico, but also in other countries with the aim of understanding the performance of this type of incubators in terms of economic development and generation of new businesses.

On the other hand, a potentially valuable line of research could explore the feasibility and effectiveness of migrating towards blended or completely remote models to provide the services offered by a business incubator. This could take advantage of technological growth in telecommunications, especially in ICT, to adapt to the changing demands of the environment.

References

- Adhana, D. and Kumar, A. (2020). Start-up ecosystem in India: A study with focus on entrepreneurship and university business incubators. *AE GA EUM Journal*, 8 (9). <http://aegaeum.com/gallery/agm.j-4046.80-f.pdf>
- Ali, A., Irfan, S., and Salman, Y. (2022). A Scientometric Analysis of University Business Incubators and Accelerators Based on 20 Years of Research. *Journal of Management and Research*, 9 (1). <https://doi.org/10.29145/jmr/91/03>
- Aliaga, A., Camargo, A. and Oliveros, R. (2019). *The influence of university incubators in the birth stage of Startups in the Peruvian context: BIOINCUBA case study* (degree thesis). Pontifical Catholic University of Peru. <https://tesis.pucp.edu.pe/repositorio/handle/20.500.12404/15750>
- Alsaad, M. A. (2021). Business Incubators: A Strategy for College Sustainability in Higher Education an Exploratory Study at Al-Kunooz University College / Basra. *Journal of Small Business and Entrepreneurship Development*, 9 (1). <https://doi.org/10.15640/jsbed.v9n1a1>
- Álvarez, AA, Arbaiza, FM and Alpaca, HA (2019). S360° Incubator and the creation of businesses by university students. *Science and Business*, 1 (2). <http://doi.org/10.22497/Cien.yNeg.12.1201>
- Audretsch, D.B., and Belitski, M. (2019). Science parks and business incubation in the United Kingdom: Evidence from university spin-offs and staff start-ups. *Science and technology parks and regional economic development* (pp. 99-122). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-30963-3_7
- Ayodele, M., Ejovwokeoghene, M., Nwonye, J. and Ebakoleaneh, D. (2019). Business incubation and student idea validation: A focus on Nigerian universities. *Journal of Entrepreneurship Education*, 22 (1), 1-6. <https://www.abacademies.org/articles/Business-incubation-and-student-idea-validation-1528-2651-22-1-286.pdf>
- Barajas, J.M. (2022). *Description of the current state of university incubators and accelerators in Latin America* (doctoral thesis). EAFIT University. https://repository.eafit.edu.co/bitstream/handle/10784/30941/JuliethMarisol_BarajasRomero_2022.pdf?sequence=2&isAllowed=y
- Chan, Y.E., Krishnamurthy, R., and Sadreddin, A. (2022). Digitally-enabled university incubation processes. *Technovation*, 118. <https://doi.org/10.1016/j.technovation.2022.102560>

- Dee, N., Gill, D., Lacher, R., Livesey, T., & Minshall, T. (2013). *A review of research on the role and effectiveness of business incubation for technology-based start-ups*. University of Cambridge. <https://doi.org/10.17863/CAM.44134>
- Gaona, LL, Ruíz, FM and Vázquez, VA (2020). Problems of the entrepreneurial student and the support required from a business incubator. *Repository of the International Network of Competitiveness Researchers*, 12, 1703-1716. <https://www.riico.net/index.php/riico/article/view/1544>
- Gorączkowska, J. (2020). Enterprise innovation in technology incubators and university business incubators in the context of Polish industry. *Oeconomia Copernicana*, 11 (4), 799-817. <https://doi.org/10.24136/oc.2020.032>
- Guerrero, M., Urbano, D. and Gajón, E. (2020). Entrepreneurial university ecosystems and graduates' career patterns: do entrepreneurship education programs and university business incubators matter? *Journal of Management Development*, 39 (5), 753-775. <https://doi.org/10.1108/JMD-10-2019-0439>
- Hassan, NA (2020), University business incubators as a tool for accelerating entrepreneurship: theoretical perspective. *Review of Economics and Political Science*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/REPS-10-2019-0142>
- Herazo, J. A. (2019). *Study of business incubators in the national and international entrepreneurship ecosystem with a focus on incubators under the auspices of universities and their connection with the ecosystem* (master's thesis). Pontifical Catholic University of Chile. <https://repositorio.uc.cl/handle/11534/26919>
- Hewitt, L.M.M., & van Rensburg, L.J. (2020). The role of business incubators in creating sustainable small and medium enterprises. *Southern African Journal of Entrepreneurship and Small Business Management*, 12 (1), a295. <https://doi.org/10.4102/sajesbm.v12i1.295>
- Janqui, A. (2020). A management proposal for the university startup incubator in Peru. *Industrial Data*, 23 (2), 39-50. <https://www.redalyc.org/articulo.oa?id=81665362004>
- Kiani, R., Gheibdoust, H., Khanfar, A., and Kiani, N. (2019). Ranking factors influencing strategic management of university business incubators with ANP. *Management Decision*, 57 (12), 3492-3510. <https://doi.org/10.1108/MD-06-2018-0688>
- Leitão, J., Pereira, D. and Gonçalves, Â. (2022). Business Incubators, Accelerators, and Performance of Technology-Based Ventures: A Systematic Literature Review. *Journal of Open Innovation: Technology, Market, and Complexity*, 8 (1), 46. <https://doi.org/10.3390/joitmc8010046>

- Li, C., Ahmed, N., Ali, S., Khan, A., and Naz, S. (2020). Role of business incubators as a tool for entrepreneurship development: the mediating and moderating role of business start-up and government regulations. *Sustainability*, 12 (5), 1822. <https://doi.org/10.3390/su12051822>
- Lukeš, M., Longo, M.C., and Zouhar, J. (2019). Do business incubators really enhance entrepreneurial growth? Evidence from a large sample of innovative Italian start-ups. *Technovation*, 82, 25-34. <https://doi.org/10.1016/j.technovation.2018.07.008>
- Lyken, D., Montshiwa, B., Kenewang, S., & Mogotsi, T. (2020). Stimulating Academic Entrepreneurship through Technology Business Incubation: Lessons for the Incoming Sponsoring University. *International Journal of Higher Education*, 9 (5), 1-18. <https://doi.org/10.5430/ijhe.v9n5p1>
- Mayer, EL, Blanco, FJ, Alonso, M. Á. and Charles, J. A. (2020). Entrepreneurship and economic growth: The Mexican business incubator system. *Journal of Social Sciences*, 26 (1), 107-127. <https://www.redalyc.org/journal/280/28063104011/>
- Mayer, EL, Charles, JA and De la Garza, MI (2019). Entrepreneurial promotion from the Mexican university. *Venezuelan Management Magazine*, 24 (85). <http://www.redalyc.org/articulo.oa?id=29058864003>
- Moreno, A. (2021). Scientific work from an organizational perspective: case study in an Argentine university incubator. *Open Space*, 30 (3), 169-195. <https://www.redalyc.org/articulo.oa?id=12268654008>
- Muslim, S.A. (2021). The Role of Business Incubators in the Economic Development and Creativity in Jordanian Universities: Evidence from Mutah University. *Academic Journal of Interdisciplinary Studies*, 10 (1), 266-282. <https://doi.org/10.36941/ajis-2021-0023>
- Nicholls, C., Valliere, D., and Hassannezhad, Z. (2018). A typology of university business incubators: Implications for research and practice. *International Conference on Innovation and Entrepreneurship* (pp. 535-XXII). Academic Conferences International Limited. <https://publications.hse.ru/mirror/pubs/share/direct/225599751.pdf>
- Osiobe, EU and Winingham, K. (2020). Why Universities Create and Foster Business Incubators? *Journal of Small Business and Entrepreneurship*, 8 (1), 1-12. <https://doi.org/10.15640/jsbed.v8n1a1>
- Pacheco, D.K. (2021). *Management of business incubators in national universities: Proposal for implementation and improvement, 2019* (master's thesis). César Vallejo University. https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/76704/Pacheco_SDK-SD.pdf?sequence=1

- Padilla Ávila, RM and Urbizo, MA (2020). Implementation of a business incubator at the central regional university center (curc) of the National Autonomous University of Honduras (unah). *Economics and Administration (E&A)*, 11 (1). <https://doi.org/10.5377/eya.v11i1.10515>
- Padilla, JR (2017). *Determinants of entrepreneurial intentions in business administration students* (master's thesis). Autonomous University of Baja California. <https://repositorioinstitucional.uabc.mx/bitstream/20.500.12930/682/1/ENS087255.pdf>
- Palomera, A.D. (2022). *Methodology for financing entrepreneurial projects* (terminal diploma work). Autonomous University of Baja California. <https://repositorioinstitucional.uabc.mx/bitstream/20.500.12930/9008/1/FCA020834.pdf>
- Rakthai, T., Aujirapongpan, S., and Suanpong, K. (2019). Innovative capacity and the performance of businesses incubated in university incubator units: Empirical study from universities in Thailand. *Journal of Open Innovation: Technology, Market, and Complexity*, 5 (2), 33. <https://doi.org/10.3390/joitmc5020033>
- Ramar, R.N., and Muthukumar, C.K. (2019). Role of business incubation centers in promoting entrepreneurship in Tamilnadu. *International Journal of Advanced Research in Management and Social Sciences*, 8 (6), 125-133. <https://garph.co.uk/IJARMSS/June2019/G-2601.pdf>
- Razo, S. R. (2020). *Entrepreneurial intention in university students who have support from a university incubator* (doctoral thesis). Autonomous University of Baja California. <https://repositorioinstitucional.uabc.mx/bitstream/20.500.12930/8808/1/ENS093049.pdf>
- Reyes, L. and Carmona, FA (2020). *Documentary research for the ontological understanding of the object of study*. Simon Bolivar University. <https://bonga.unisimon.edu.co/bitstream/handle/20.500.12442/6630/La%20investigaci%C3%B3n%20documental%20para%20la%20comprensión%20ontológica%20del%20objeto%20de%20estudio.pdf?sequence=1&isAllowed=y>
- Rodríguez, JR and Figueroa, JP (2019). Idea incubators: first step to the entrepreneurial university. *Digital Consciousness*, 2 (1), 46-51. <https://doi.org/10.33262/concienciadigital.v2i1.929>
- Rodríguez, NR (2021). *Relaunch campaign of INNICIA, business incubator of the Catholic University of Santa María*. Professional School of Advertising and Multimedia (degree work). Catholic University of Santa Maria. <https://tesis.ucsm.edu.pe/repositorio/handle/20.500.12920/10991>

- Sanyal, S. and Hisam, M. W. (2018). The role of business incubators in creating an entrepreneurial ecosystem: A study of the Sultanate of Oman. *Indian Journal of Commerce and Management Studies*, 9 (3), 10-17. <http://dx.doi.org/10.18843/ijcms/v9i3/02>
- Stal, E., Andreassi, T. and Fujino, A. (2016). The role of university incubators in stimulating academic entrepreneurship. *Revista de Administração e Inovação*, 13 (2), 27-47. https://pesquisa-eaesp.fgv.br/sites/gvpesquisa.fgv.br/files/arquivos/the_role_of_university_incubators_in_stimulating_academic_entrepreneurship.pdf
- Stradi, M. S. (2018). Proposal for a business incubation model for universities with distance education. In *EDUcation with TECHnology: a social commitment. Approaches from research and innovation* (pp. 556-561). <https://doi.org/10.21001/edutec.2018>
- Stradi, M.S. (2019). Characterization and analysis of business incubation systems in Costa Rica: The case of public universities. *Innovate*, 29 (74), 57-70. <https://doi.org/10.15446/innovar.v29n74.82061>
- Sudana, I.M., Apriyani, D., Suprpto, E., and Kamis, A. (2019). Business incubator training management model to increase graduate competence. *Benchmarking: An International Journal*, 26(3). 773-787. <https://doi.org/10.1108/BIJ-03-2018-0069>
- Tang, M., Walsh, G.S., Li, C., and Baskaran, A. (2021). Exploring technology business incubators and their business incubation models: case studies from China. *The Journal of Technology Transfer*, 46 (1), 90-116. <https://doi.org/10.1007/s10961-019-09759-4>
- Torres, JI (2021). *Insertion of the figure of community manager in the business incubator of the UAEM Valle de Chalco university center* (degree thesis). UAEM Valle de Chalco University Center. Autonomous Mexico State University. <http://ri.uaemex.mx/bitstream/handle/20.500.11799/112492/1%20TESINA.pdf?sequence=1>
- Autonomous University of Baja California (2018). *UABC Linkage: relationships for development*. General Coordination of Vocational Training and University Linkage. <https://drive.google.com/file/d/1SCZ5rwJq5BZPaUSCtePtLDAdDFTwWEL0/view>
- Autonomous University of Baja California (2022). *Entrepreneurial Maroons*. General Coordination of Linkage and Academic Cooperation. <http://www.cgvca.uabc.mx/vinculacion/cimarronesemprendedores.php>

- Vargas, PA, Liévano, J. and Calderón, G. (2021). Impact factors in entrepreneurial training in higher education students. Cety's University Case. *Inclusions Magazine*, 8 (1), 198-215. <https://revistainclusiones.org/index.php/inclu/article/view/194>
- Vera, C., Nivelá, JM, Galeas, E. and Carrasco, GM (2020). Rural MYPIMES incubators that promote the social well-being of business entrepreneurs. *Academic Relevance Magazine*, 4 (5), 274-282. <https://doi.org/10.5281/zenodo.4599709>
- Wang, Z., He, Q., Xia, S., Sarpong, D., Xiong, A., and Maas, G. (2020). Capacities of business incubator and regional innovation performance. *Technological Forecasting and Social Change*, 158, 120125. <https://doi.org/10.1016/j.techfore.2020.120125>
- Williams, EA, Couselo, RE, Pendón, MM, Cibeira, NP, Crespi, MG and Tittone, M. (2019). *University incubators: the incubator of the Faculty of Engineering of the National University of La Plata*. In V Conference on Research, Transfer and Extension of the Faculty of Engineering (pp. 558-563). <http://sedici.unlp.edu.ar/handle/10915/75609>
- Wolniak, R., Grebski, M.E., and Skotnicka, B. (2019). Comparative analysis of the level of satisfaction with the services received at the business incubators (Hazleton, PA, USA and Gliwice, Poland). *Sustainability*, 11 (10), 2889. <https://doi.org/10.3390/su11102889>
- Zotov, VB, Koniagina, MN, Shapkina, EA, Pikalova, EA and Stepanova, DI (2019). Experience in implementing student business incubator in entrepreneurship education. *Journal of Entrepreneurship Education*, 22 (4), 1-13. <https://www.abacademies.org/articles/experience-in-implementing-student-business-incubator-in-entrepreneurship-education-8380.html>