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University incubators in Ecuador as means of development: Case study at the Eloy Alfaro Lay University of Manabí, Ecuador

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Abstract---Higher education institutions in Ecuador face significant challenges in aligning their academic programs with the social and economic needs of the country. Graduates often lack the practical skills and strategic thinking needed to build businesses and foster innovation. This study focuses on evaluating the feasibility and potential impact of implementing university incubators at the Eloy Alfaro Lay University of Manabí (Uleam). A mixed methodology was used that combines qualitative and quantitative approaches. First, an exhaustive review of the literature on university incubators was conducted. Then, Uleam was selected as a case study, collecting information on institutional policies and available resources. Semi-structured interviews were carried out with teachers, students and administrators, in addition to applying surveys to a representative sample of students and graduates. Qualitative and quantitative data were analyzed using thematic coding techniques and descriptive and inferential statistical tools. The results indicate that 85.33% of respondents have not participated in an incubator, and 52% have limited knowledge about them. However, 94% showed interest in participating in university incubators. The main barriers identified include complex bureaucratic processes and a lack of knowledge about the creation and operation of incubators. A strategy was proposed to implement incubators in the university area, which includes the formation of multidisciplinary teams, training programs and the link with the private sector are essential.

Keywords---business, development incubators, higher education, training programs, university.

Introduction

Higher education institutions grant degrees to their graduates, who graduate with general knowledge, generic skills and theories that are not necessarily aligned with social, local or national reality. Therefore, these graduates are unable to develop companies, and ventures or create laws or administrative structures that can generate employment. In this context, it is observed that tertiary-level students do not carry out research or generate strategic thinking for society. That is, they only graduate with insufficient general theoretical knowledge to create or advise a company (Moran-Montalvo & Sánchez-Riofrío, 2018).

Teachers must teach students to generate business models, ventures and new products, since they have an excellent infrastructure, both teaching professionals and laboratories, libraries and experimentation spaces, when they carry out the hours of connection and pre-professional practices. All these spaces should serve to generate university incubators (Arce, 2019).

Vázquez et al (2019), in their research, state that this problem has been debated and generated in universities. Since the Second World War, in the United States, in 1948, in Illinois, a proposal for a university incubator was created to reactivate the post-war industry. For this, people, proposals and new products were needed. In this context, Romer (2020), proposed that incubators be faculties, careers or chairs strictly linked to this purpose. However, for these initiatives to materialize, institutional and legislative political will is required.

In the 50s and 60s, several South American countries, such as Argentina, Chile and Brazil, proposed these initiatives in state universities. Since then, companies born from university incubators have been created and developed. The problem is that these initiatives have not been given much priority in the country, which could be one of the reasons why it is not industrialized (Mudambi & Navarra, 2002; Morris et al., 2005).

Incubators for service business development or thought generation for social transformation have been studied by many authors over the last decades in Europe, Asia and Latin America (Tapia, 2020). In this context, it is worthwhile to implement these initiatives at the Eloy Alfaro Lay University of Manabí. Being able to implement these experiences would allow future generations to acquire professional skills, new ventures and, above all, demonstrate that higher education not only grants degrees but also delivers products, business models and development, offering society tangible results of studies, and experiences validated by other universities.

Regarding research on incubators in Ecuadorian universities, there is not much literature nor many incubators registered in SENESCYT (Ackney, 2019). Furthermore, there are no publications on the results of the incubators born in Ecuadorian universities. Arce (2019), points out in his research that 93% of companies are created by private initiative, while the rest are created by the State. In countries like Argentina and the United States, university incubator companies represent only 0.8%. Likewise, Moran-Montalvo & Sánchez-Riofrío (2018), demonstrate in their research that, in the 1990s, countries such as Chile, Argentina and Brazil began to develop incubator initiatives in private universities.

Higher education institutions in Ecuador face the challenge of aligning their academic programs and educational practices with the real needs of the social and economic environment. Despite having adequate infrastructure and trained professionals, many graduates are unable to apply their theoretical knowledge in the creation of companies or the generation of innovation. This problem is compounded by the lack of research and strategic thinking at the tertiary level. International experiences, such as university incubators in the United States and South America, offer a valuable model that could be adapted and improved in the Ecuadorian context. This study focuses on the Universidad Laica Eloy Alfaro de Manabí as a case study to evaluate the feasibility and potential impact of implementing university incubators in Ecuador (Leitão et al., 2022; Vanderstraeten et al., 2020).

The general objective of this study is to analyze the role of university incubators in promoting innovation and entrepreneurship in higher education institutions in Ecuador. It seeks to identify the barriers and opportunities that these incubators face, as well as propose strategies to strengthen their impact on the economic and social development of the country.

Materials and Methods

A mixed methodology was used that combines qualitative and quantitative approaches. A bibliographic review of the existing literature on university incubators at an international and national level was carried out, and scientific articles, institutional reports and relevant case studies were analyzed to understand the current state of research and practices in this field. Semi-structured interviews were conducted with faculty, students, and university administrators to obtain qualitative perspectives on the opportunities and challenges of implementing a university incubator. The interviews were transcribed and analyzed using thematic coding techniques, qualitative and quantitative data were integrated to provide a holistic view of the current state and potential of university incubators in Ecuador. Triangulation methods were used to ensure the validity and reliability of the findings. This methodological approach allowed a deep and multidimensional understanding of the phenomenon studied, providing a solid basis for the implementation of university incubator initiatives that contribute to sustainable development in Ecuador.

Analysis and Discussion of Results

In the 1990s, incubator initiatives began to emerge in universities, especially focused on technological development (Versino, 2000). These initiatives, driven by research work and the need to update both private and public business processes, allowed 5% of the initiatives to be developed in public universities. To avoid the failure of ventures, universities have begun to develop research, comparisons and theoretical analyses that allow them to reflect on new proposals and debate the state of local companies (Paredes et al., 2020). However, 74% of respondents in this research mentioned that the bureaucratic and non-technical processes when presenting innovative ideas from incubators have been poor, complicated and incomprehensible.

The difficulty in the process of suggesting an incubator lies in identifying the characteristics of the entrepreneur and, above all, differentiating them between the people in the environment and those who finance the idea of entrepreneurship (Alcaraz, 2017). From that perspective, there are several studies carried out in Ecuador that show results on the number of existing companies by areas, regions or provinces. According to data from ULEAM (2020), there are 78,682 companies in Manabí, which represents 8.75% of the national total, with a proportional index of 512 companies per 10,000 inhabitants, a figure well below the national index of 529 companies per every 10,000 inhabitants.

It is worth mentioning that all the companies mentioned in this statistic are private and not born from university incubators, that is, they did not emerge from the ULEAM university incubator. Therefore, this research aims, based on these statistical bases, to make an academic proposal for the creation of the University Incubator Center for Entrepreneurship and Local Development. From this perspective, several authors have proposed methodological strategies for the creation of incubators in higher education. [Guzmán \(2020\)](#), proposes that universities are protected spaces designed for the creation of entrepreneurship and local development incubators. Within the university community, processes of design, creation, evaluation and obtaining results can be developed in the short, medium and long term, thus allowing the generation of longitudinal studies over several decades.

In this first part of the research, the results obtained in the surveys were described. One of the first questions was related to the knowledge that respondents had about university incubators. A survey was designed and applied to a representative sample of students and graduates to collect quantitative data on their perceptions and experiences related to entrepreneurship and innovation. Data were analyzed using descriptive and inferential statistical tools ([Figueiró & Raufflet, 2015](#); [Georgina & Olson, 2008](#)).

A case study was taken into account at the Universidad Laica Eloy Alfaro de Manabí (ULEAM), due to its infrastructure and academic programs oriented to entrepreneurship. Detailed information was collected about institutional policies, available resources, and previous experiences related to incubators and entrepreneurship. The knowledge of university incubators was investigated, and Figure 1 shows the results

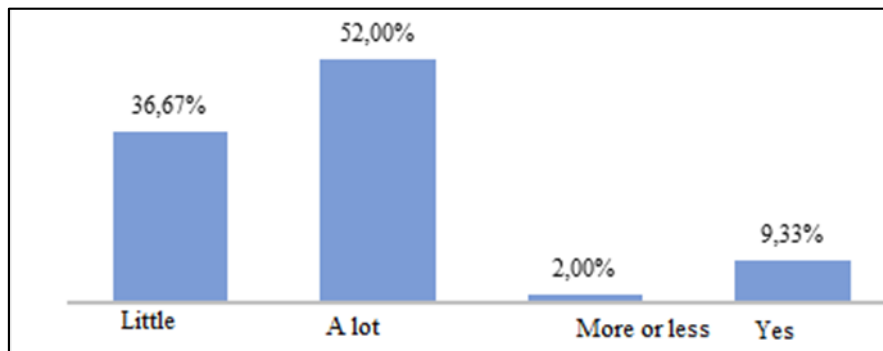


Figure 1. Knowledge of university incubators

In this question asked to the students and teachers it can be identified that they know little about what a university incubator is, in the same way, we can interpret that 52% of those surveyed know little, this means that it is difficult for teachers to encourage them to be part of incubators if they don't know what it is. The use of university incubators was consulted, the results are seen in Figure 2.

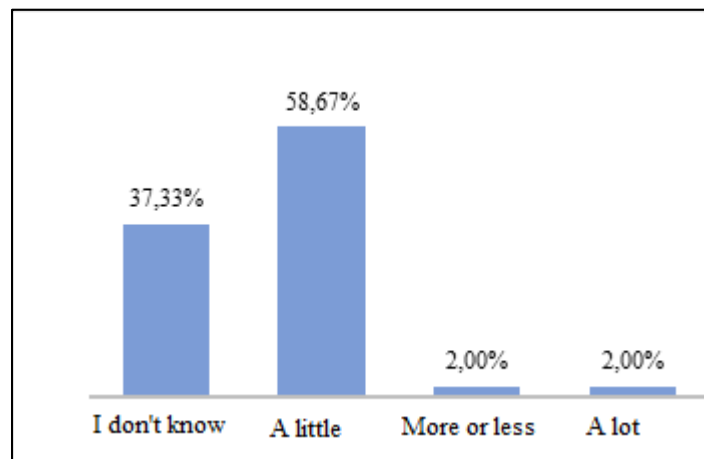


Figure 2. Use of university incubators

In this question, he asked the 60 teachers where it was identified that 58% do not know what they are for. Following the previous question, 52% know little about university incubators, the lack of knowledge of the topic investigated is notable. The teachers were asked if any of them had participated in a university incubator, results shown in Figure 3.

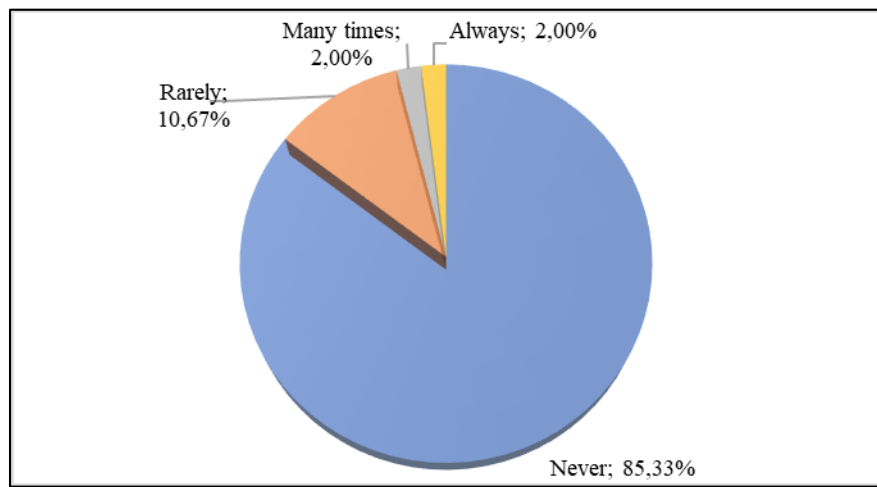


Figure 3. Participation in an incubator

Following the two previous questions, in question three the sequence of ignorance and non-participation is maintained, what can be differentiated is that 10.87% participate and in the previous questions 36.67% say that they do not know and 37.33 do not know what an incubator is for. If they don't participate, then they don't know what it's for. It is a bit contradictory, but these results are still important. A question was asked about whether they would like to participate in a university incubator. The results are shown in Figure 4.

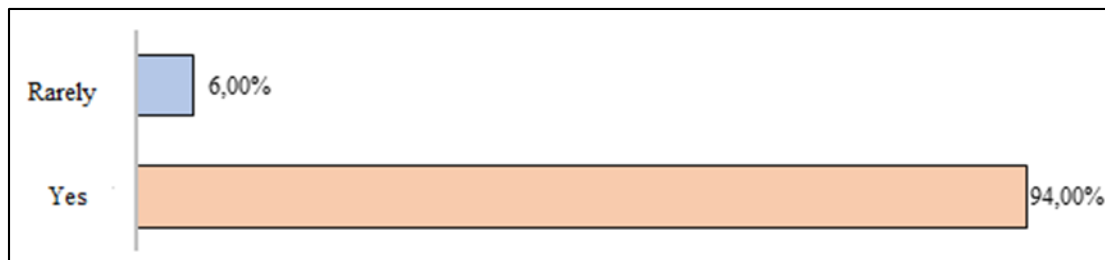


Figure 4. Would you like to participate in an incubator

The answer to this question is overwhelming: 94% of those surveyed would like to participate in university incubators. The important thing to note here is that they are unaware and do not know what it is for, but if they are interested in participating, this is a very positive attitude on the part of the respondents, which means that the interest is high and therefore the fact that they have said no. They know what it is for, it is not the fundamental thing, the important thing is that they want to participate.

Some researchers have highlighted that not only the creation of the incubators is important, but also the model, characteristics and projections that they have Alcaraz (2017). In the same way, Arce (2019) in his study showed that 93% of companies are created by private initiative, that is, by those who have economic resources. This suggests that only those who have money can create a company. From the point of view of the results of this research, there is also a general lack of knowledge about how companies work and how they are created.

85.33% of respondents revealed that they had not participated in an incubator, which implies that they have not been involved in the creation of a company. This opens the debate about the need to know, learn, design, experiment and test. Therefore, it is essential to acquire theoretical knowledge, carry out market research, feasibility studies and substantiate projects with group studies and surveys, among other activities (Stal et al., 2016; Rothaermel & Thursby, 2005).

Moran-Montalvo & Sánchez-Riofrío (2018), in their research, mentioned that university incubators flourished in the 90s, mainly motivated by technology. However, not all countries were concerned about this creation, with

Argentina, Brazil, Mexico and Chile being the ones that have focused the most on this aspect. In Ecuador, although research has been carried out on the topic, incubators have not been created in Ecuadorian universities.

In this context, [Romer \(2020\)](#), proposed that incubators should be a constituent part of higher education institutions. More than 12% of universities in Latin America have proposed these initiatives, but they have not produced favorable results that can be identified as significant achievements.

[Tapia \(2020\)](#), mentions that European countries have given priority to university incubators. After World War II, industries needed to improve their production, but they lacked skilled labor and production lines were not optimized. Incubators helped develop processes and flow charts that enabled better performance.

[Paredes et al. \(2020\)](#), indicate that the deficit of incubators in Latin American universities is due to ignorance of their usefulness in the economic development of a country. These data coincide with the fact that 52% of those surveyed know little about incubators, which shows that university institutional policies must support these business initiatives.

Proposed Strategies: Based on the results obtained, recommendations and strategies were developed to strengthen university incubators at the Eloy Alfaro Lay University of Manabí and other higher education institutions in the country. These strategies include institutional policies, training programs and alliances with the private and government sectors.

Methodological proposal

A methodology strategy is presented for the creation of university incubators for entrepreneurship and economic development shown in Figure 5.

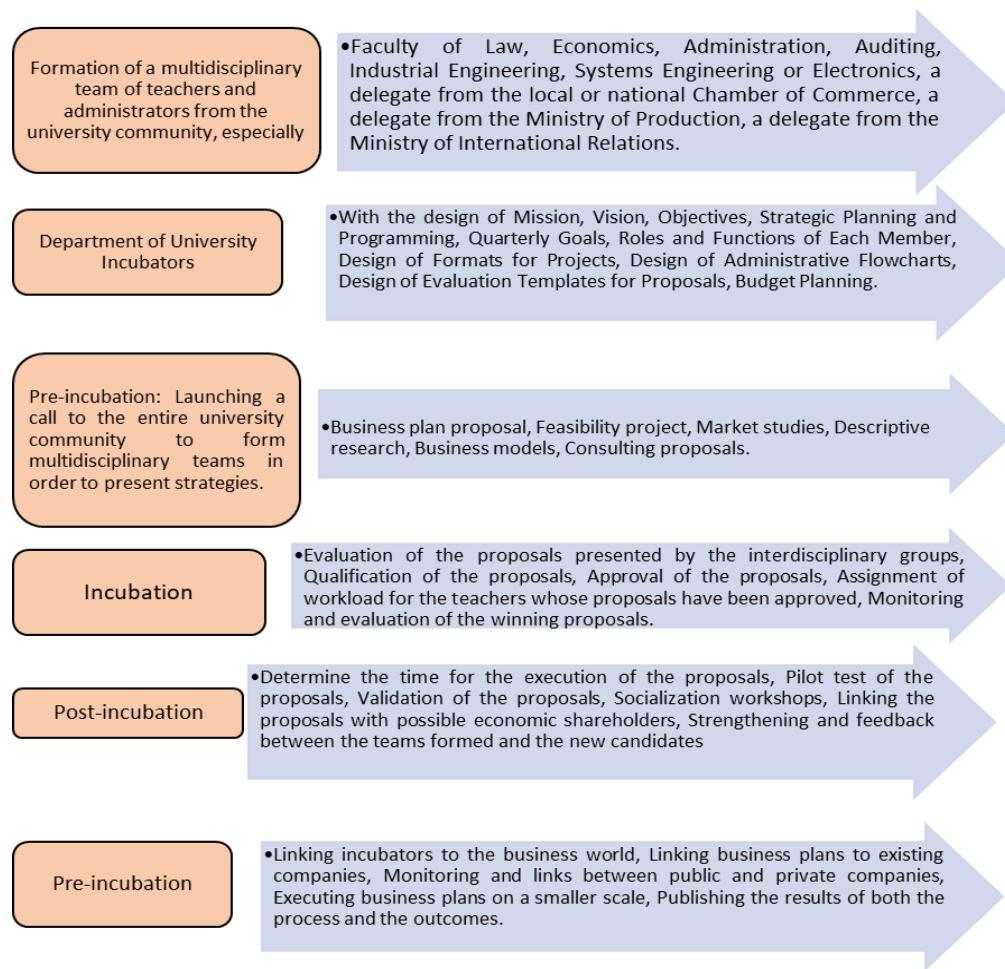


Figure 5. Strategy for creating incubators

Based on the results obtained, recommendations and strategies were developed to strengthen university incubators at the Universidad Laica Eloy Alfaro de Manabí and other higher education institutions in the country. These strategies include institutional policies, training programs and alliances with the private and government sectors.

The international experience offers valuable lessons for Ecuador. In countries such as Argentina, Brazil, Mexico and Chile, university incubators have been key to promoting technological and business innovation. Although in some cases the impact has been modest, such as in the United States where only 0.8% of companies come from university incubators, these initiatives have demonstrated their potential to transform the business and academic landscape (Wonglimpiyarat, 2016; Rothaermel & Thursby, 2005). Romer (2020) and Tapia (2020), highlight that incubators must be an integral part of higher education institutions, with political and financial support that guarantees their sustainability and effectiveness. These experiences highlight the need for political and institutional support for the success of these initiatives. With a proactive and collaborative approach, Ecuadorian universities can create an ecosystem of innovation and sustainable entrepreneurship.

Conclusions

Higher education institutions in Ecuador face the challenge of aligning their academic programs with the real needs of the social and economic environment. Despite having adequate infrastructure and trained professionals, graduates often leave with general theoretical knowledge that does not translate into practical skills for business creation or innovation. This phenomenon reflects a disconnect between higher education and the labor market, exacerbated by the lack of applied research and strategic thinking among tertiary students. As a result, graduates are not prepared to contribute effectively to the economic and social development of the country, limiting the impact of higher education (Riyanti & Reski, 2022).

The need for universities to implement business incubators can be raised. These initiatives can take advantage of the existing infrastructure and human resources of the institutions, converting laboratories, libraries and experimentation spaces into centers of innovation and entrepreneurship. Alcaraz (2017) and Arce (2019), highlight the importance of designing incubator models that not only promote business creation but also provide a hands-on learning environment for students. However, the success of these incubators depends on overcoming bureaucratic and knowledge barriers, which currently prevent innovative ideas from becoming viable projects.

For the implementation of university incubators in Ecuador and to be a catalyst for the economic and social development of the country, strategies were proposed, which include the formation of multidisciplinary teams, the development of training programs and the link with the private and government sector, are essential to maximize the impact of these initiatives. Ecuadorian universities must adopt a proactive and collaborative approach to overcome current challenges and create an ecosystem of innovation and entrepreneurship that benefits both students and society at large.

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