

# **THE ROLE OF UNIVERSITIES IN REGIONAL DEVELOPMENT: THE CASE OF THE STATE UNIVERSITY OF CEARÁ (UECE), BRAZIL.**

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## **Abstract**

According to the Times Higher Education through The Impact Rankings 2021, the State University of Ceará (UECE) is ranked 92nd in the world and 4th in Brazil in "Quality Education", besides being indicated as one of the best universities in Latin America and the Caribbean by the Latin America University Rankings 2021. Thus, the purpose of this paper is to discuss the role of UECE in the regional development of the State of Ceará-Brazil. For this, part of the available theoretical referential and secondary data was used, taken from official documents, such as the Institutional Development Plan, the Management Report, and the catalog "UECE in numbers", collected through the institution's website. With the proposed work, it was noted that the UECE has sought to contribute to regional development, by bringing from its mission, principles, and values related to diversity and the environment, and the search to reduce social disparity. It was concluded that the UECE is an entrepreneurial university, as it creates mechanisms to support innovation, technological development, and the entrepreneurial spirit of its students and faculty. Furthermore, it is a fundamental part of the Triple Helix of State of Ceará-Brazil, because through partnerships with the State Government and the private sector it promotes programs and projects for society, through research, incubator development, and inclusive activities.

**Keywords:** Regional Development. Entrepreneurial Universities. Triple Helix.

## **1 Introduction**

Regional development is a term that has been discussed for many years due to its importance and breadth. According to Fochezatto (2010), the study of regional development seeks to develop an environment with competitive potential and integrated with other regions and localities, thus forming comprehensive economic relationships. In addition, this approach links to innovation, since efforts are intensified to create a means, through the invention of new or old regional processes arising from the inventive capacity.

Universities can play a key role in promoting regional development. In addition to the mission of teaching, which is already consolidated as being of great relevance, the university's contribution has been extended to research and socio-economic development, ranging from external teaching to activities linked to spin-off companies. Thus, like the concept of regional development, the contribution of universities is a diversified and complex phenomenon (VARGA and ERDŐS, 2019).

Due to this complexity and diversification, some studies have been developed to try to understand the relationship of universities with regional development, covering theories such as Innovation Clusters and Networks, Regional Engagement, Civic University, Entrepreneurial University, and Triple Helix, among others. Which, despite

being distinct theoretical models, one of the university's contributions is the transfer of knowledge generated in the university core itself, as well as spilling over to the region.

For believing that the State University of Ceará (UECE) can be defined as an Entrepreneurial University that encompasses the Triple Helix, the focus of this study will be on these two theories. According to Etzkowitz and Zhou (2017), the university taken as entrepreneurial defines its institutional strategy, and participates in the creation of joint socio-economic development projects at the regional level, in addition to incorporating traditional critical functions. With this, while, developing such development, there is the junction between university, industry, and government, the so-called "Triple Helix" occurs.

In Brazil, there has been a breakthrough in entrepreneurship education, which focuses on identifying entrepreneurial students and developing social inclusion through mandatory entrepreneurship subjects and incubator<sup>1</sup> projects (ETZKOWITZ and ZHOU, 2017). According to Etzkowitz, De Mello, and Almeida (2005), incubation has become a worldwide phenomenon as part of regional policies and has grown exponentially in Brazil, in which there are currently more than 230 incubators, encompassing technology-based companies, of traditional economic sectors, cooperatives, among others.

Created on March 10, 1975, through Decree No. 11.233, the State University of Ceará has as its mission "to produce and disseminate knowledge and train professionals to promote sustainable development and quality of life in the region" (UECE, PAGE 19, 2018). Thus, the objective of this paper is to discuss the role of the State University of Ceará (UECE) in regional development. For this, part of the available theoretical reference will be used, and secondary data taken from official documents, such as the Institutional Development Plan, Management Report, and the catalog "UECE in numbers"<sup>2</sup>, collected through the institution's website.

The justification for the research is given by the literary contribution of the role of universities for regional development, besides the importance of the State University of Ceará for Brazil, which, according to the *Times Higher Education (THE)* through *The Impact Rankings 2021*<sup>3</sup>, the UECE is ranked 92nd in the world and 4th in Brazil in "Quality Education", besides being indicated as one of the best universities in *Latin America and the Caribbean by the Latin America University Rankings 2021*.

This paper is structured in three sections, besides this introduction. The second section is composed of a literature review with part of the available education production on the role of universities in regional development, focusing mainly on the theories of the "Entrepreneurial University" and "Triple Helix". The third section presents the results and discussions, in which initially a brief history of the UECE will be presented, as well as its mission and principles, and, soon after, the focus will be on the analysis of the data on programs, courses, and projects managed at the university. Finally, in the fourth section, there is the conclusion of the research.

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<sup>1</sup> Incubation is an educational process to form well-functioning organizations and involves an expansion of the academic educational mission of training individuals to educational organizations. (ETZKOWITZ, DE MELLO, and ALMEIDA, 2005).

<sup>2</sup> Statistical data released annually on programs, courses, and projects managed at the university.

<sup>3</sup> Evaluates universities against the United Nations (UN) Sustainable Development Goals (SDGs).

## 2 Universities and Regional Development

The university is a major promoter of regional development, however, because it constitutes a large and complex system, there is a vast literature that attempts to explain such a feat. From an introductory and historical perspective, Varga and Erdős (2019) mention theories about the effects of the regional university, such as the multiplicative "spending impacts" on the region by Florax (1992)<sup>4</sup>, the "knowledge transfer effects" explained by Varga (1998), the "importance of capital investments, leadership and regional influence" analyzed by Goldstein et al. (1995), besides presenting works that support such relationship, in which it is worth mentioning Varga (2002)<sup>5</sup>, Lawton Smith (2007) and Goddard and Vallance (2011)<sup>6</sup>.

The mission of the university currently goes beyond teaching and research, for Serra, Rolim, and Bastos (2020) this mission encompasses actions developed in conjunction with the community, thus assuming an engaging role. Going in this same perspective, Ferreira and Leopoldi (2013) believe that a university based only on knowledge has been supplanted by a university involved in technological processes and innovation, in addition to local political leadership, thus assuming an entrepreneurial perspective.

The entrepreneurial university has or seeks a defined institutional strategy, acting actively in community and innovation projects. For this, it is based on four pillars: academic leadership focused on a strategic vision; legal control over academic resources; technology transfer (patenting, licensing, and incubation); and an entrepreneurial spirit among university entities. This concept emerged from the strategic vision of university development through land-grant and, soon after, technology and industry (ETZKOWITZ and ZHOU, 2017).

According to Gibb et al. (2013) universities taken as entrepreneurial empower university entities to demonstrate and effect, in addition to teaching and knowledge, creative and innovative research, and entrepreneurship beyond the "university walls." In doing so, one moves from a complex social environment full of uncertainties tied to a small vision, to mutual learning of discovery through a process of local and often global social engagement.

From an entrepreneurial vision emerged the interaction between university, industry, and government, the so-called Triplex Helix. This concept focuses on the university as a source of entrepreneurship, technology, and critical research, which, together with industry and government, have led to the venture capital firm, the incubator, and the science park. In the "Triple Helix" movement, the university takes on the role of the industry by encouraging the emergence of new companies from research (capitalization of knowledge), and in turn, companies conduct training with high degrees as well as sharing knowledge (the role, in principle, of universities), and governments act as public venture capitalists (ETZKOWITZ and ZHOU, 2017).

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<sup>4</sup> Analysis of spending by teachers, staff, and students in the region (FLORAX, 1992).

<sup>5</sup> Discusses the first findings on university impacts (VARGA, 2002).

<sup>6</sup> They criticize the role of universities in regional development (LAWTON SMITH, 2007) and (GODDARD AND VALLANCE, 2011).

For Etzkowitz, De Mello, and Almeida (2005), the Triple Helix process is defined as the industry acting as the locus of production, the university as the source of new knowledge and technologies, and the government as the source of contractual relationships, thus constituting key actors for any innovation strategy. However, for them, this model needs to adapt to the reality of developing countries and localities and requires a university that supports research centers, community colleges, and technical institutes, in which incubators play an important role in this process.

Bringing this discussion to Brazil, the country has undergone a transition from a top-down innovation system to a triple helix model, in which the university has a greater social role. Thus, research groups emerged as quasi-companies and, soon after, a set of networks was created in a Triple Helix format, using the incubator model to meet social and economic needs, for example in actions to combat poverty. Thus, the Brazilian incubator movement, which emerged in the wake of the military regime in 1980, represents a new direction in technology, science, and industry in Latin America (ETZKOWITZ, DE MELLO, and ALMEIDA, 2005).

Going along this line, Etzkowitz and Zhou (2017) state that currently the Brazilian educational model focuses on identifying entrepreneurial students through incubator projects aimed at social inclusion, in which one notices an advance in entrepreneurial education in the country. For example, undergraduate students at some universities are required to take a basic entrepreneurship course and, in addition, there is a growing number of incubators present at universities in the country.

### **3 State University of Ceará and the promotion of regional development<sup>7</sup>**

The history of the State University of Ceará begins after the sanctioning of Law No. 9753 of October 18, 1973, which authorized and granted the Executive Power of the State of Ceará to create the Educational Foundation of the State of Ceará - FUNEDUCE (the first name given to the institution). However, it was only on March 10, 1975, that the UECE was actually "born" from the junction of seven other institutions.

"Formed from several initiatives that sought to provide the people of Ceará with quality education, the UECE was a pioneer in the interiorization of higher education in Ceará, became a major teacher trainer for Basic Education, and serves, in its evening courses, in the capital, and in the interior, the population that studies and works. It has grown, consolidated undergraduate teaching, basic research, and *stricto sensu* post-graduation. Today, it seeks the leap to applied research, technological innovation, the defense of intellectual property and business incubation, in pursuit of the following global objectives" (UECE, PAGE 23-24, 2018).

The UECE is based on undergraduate and graduates' education, in addition to having research, extension, and technological innovation. However, the institution goes far beyond this, as it promotes courses, programs, and projects free of charge to local

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<sup>7</sup> All data in this section were collected through official documents of the institution itself, namely: Institutional Development Plan (2012-2016) and (2017-2021), Management Report 2020, and "UECE in numbers" catalogs for the period from 2001 to 2019, in which they are referenced in the "REFERENCES" section.

society to pass on knowledge, as well as a form of re-socialization of itself, while developing the role of a social institution, thus constituting its mission, which is to generate a social commitment to the local community and promote socio-economic development in Ceará, Brazil.

In this way, the role of the UECE for regional development will be discussed through the policies that make up the institution's pedagogical project. Thus, the analysis will be divided into five parts, namely: administration; undergraduate, graduate, and research; service to students and inclusive and affirmative actions; extension; and technological innovation.

### *3.1.1 Administration*

Being part of the Pro-Rectorate of Administration - PROAD, the UECE's administrative policy has as its mission to support the development of institutional activities that encompass the three primary axes: Teaching, Research, and Extension. To do this, it proposes, defines, plans, and executes measures that encompass the human, financial, technological, and administrative dimensions of the university. These measures, for example, comprise budget execution, contracting services, as well as the construction and maintenance of physical infrastructure, among others.

In 2019, UECE had 1119 higher education faculty members and about 380 technical-administrative servers. In addition, there are more than 500 employees providing labor services coming from outsourced companies, thus constituting a source of high employment generation and, consequently, economic growth. Thus, among the activities developed by PROAD-UECE, it is worth mentioning the daily attendance of these employees present on the twelve campuses of the university, which consists of solving doubts and questions about any problems. Besides this, there are security and access control actions for students, professors, employees, and visitors.

Every year several renovations and constructions are carried out, as well as preventive and corrective maintenance services on the institution's campuses. For example, in 2020 there were renovations and constructions, such as the Renovation and Expansion of the UECE's Center of Excellence in Entrepreneurship, Innovation, and Regional Development, which was done by a third-party company (IC Project and Constructions LTDA) for more than R\$ 1.7 million (approximately EUR 340 thousand); the Completion of the Center for Environmental Studies; the Construction of the University Restaurant of the College of Education, Sciences, and Languages; as well as the construction of the New Campus of the College of Education.

Just for illustration, the budget limit statement in 2020 for these works and projects was more than R\$ 306 million (approximately EUR 60 million). These works come from state and federal public resources, in which most of the time there is the hiring of outsourced companies. With this relationship, many workers and employees are employed, mainly residents of the community or city where the works are executed, thus generating employment and local income.

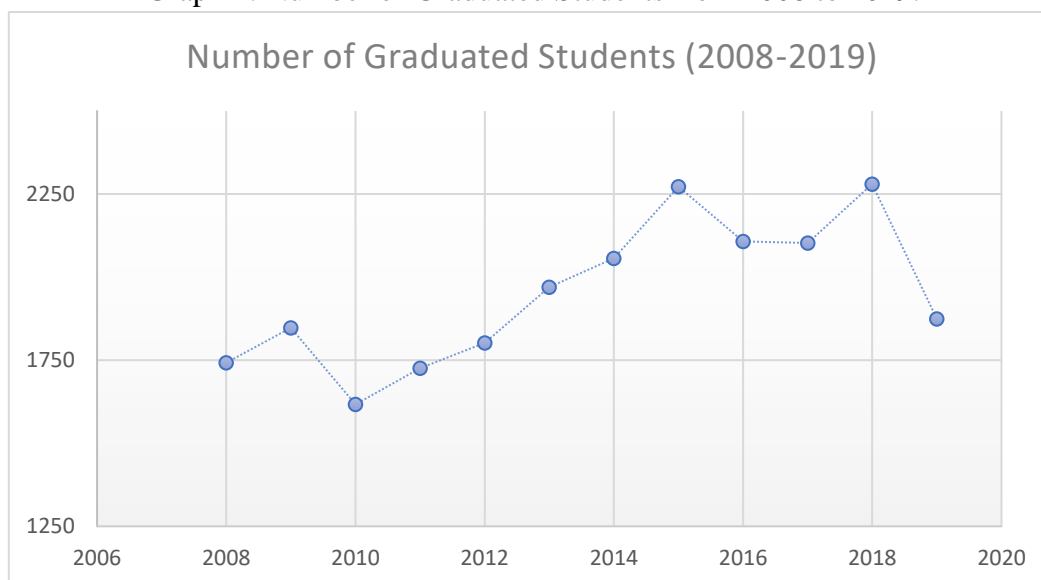
### 3.1.2 Undergraduate, graduate, and research

As part of the Pro-Rectorcy of Graduation - PROGRAD, the UECE's graduation policy is based, among other aspects, on the creation of courses that refer to the development demands of the State of Ceará and that consider the transformations of the labor market, academic policy, and social responsibility. In addition, one of the objectives of this pro-rectory is the adoption of innovative pedagogical practices, by offering scientific research, distance learning undergraduate courses, and the use of new information and communication technologies.

Distributed to more than 30 courses, the number of students graduating from UECE between 2008 and 2019 was 23396. Despite not having concrete data on the insertion of these students in the labor market, it can be stated that this number represents great importance for regional development, especially in a still-developing state like Ceará, because once graduate there is a greater chance of getting a job, in addition to the growth of social capital and knowledge generated with these studies.

The evolution of the number of graduates in the university between 2008 and 2019 is illustrated in Graph 1. Despite a drop in 2019, due to the Covid-19 pandemic, the growth of graduating students since 2008 is noticeable, a fact that shows a positive evolution and, possibly, prestige and regional impact of the university.

Graph 1: Number of Graduated Students from 2008 to 2019.



Source: Own elaboration based on data from the "UECE in numbers" catalog.

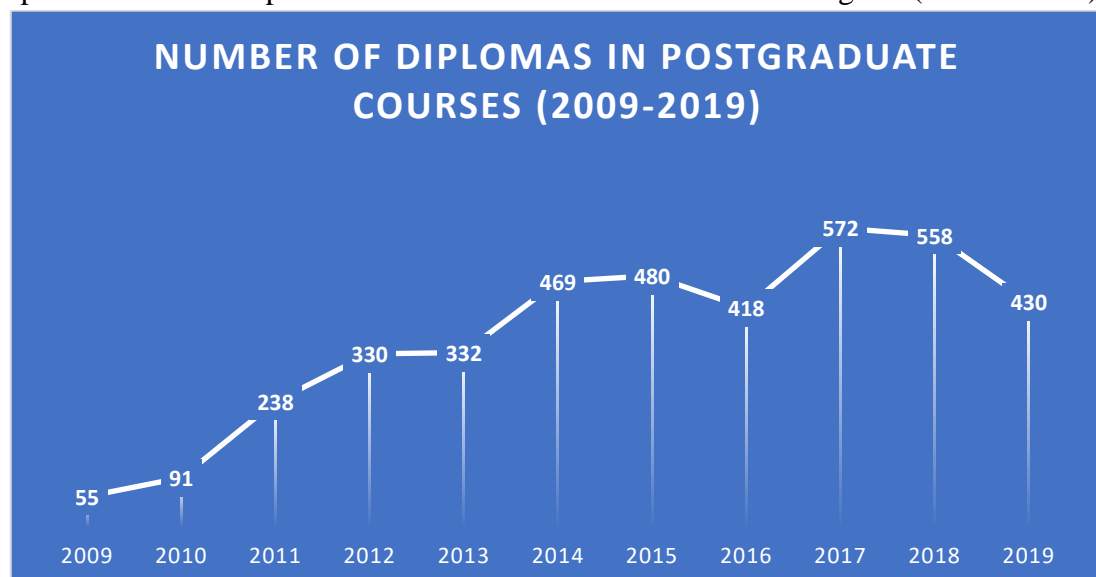
Besides the "traditional" courses, the UECE provides its students with special national and international undergraduate support programs. These programs are not part of the physical structure of the university and have external funding. Internationally, the university has programs such as "Sciences Without Borders", "International Graduation Program", and international agreements with several universities around the world, including Hungary, through the "Undergraduate Student Agreement Program".

On a national level, we highlight the programs that provide scholarships financed by state and municipal bodies and private initiatives, as is the case of the "Institutional Program of Scholarships for Initiation to Teaching", and the "Academic Monitoring Program Tutorial Education Program". Besides, being funded by the Federal Government of Brazil, the UECE has programs such as the "Support Program for Higher Education and Indigenous Graduation", "National Plan for Education Teacher Training", as well as projects that aim at the development of basic education, as is the case of the "New Talents Program", which stimulates cultural and academic activities; and the "Interdisciplinary Laboratory for Educator Training", which aims at the creation of equipment and methodologies to try to revert the problems of regional basic education.

All these programs are factors in promoting development, in which there is an interaction between the student, the university, and the community (be it national or international). Once inserted in these projects, the student, as well as the teacher, develops teaching and learning skills that in most cases are passed on to the others.

Concerning UECE's post-graduation policy, linked to the Pro-Rector of Post-Graduation and Research - PROPGPq, it aims to develop the quality of teaching through specialized training and research that meets mainly the socio-economic and cultural demands of Ceará. Academic performance data showed that between 2009 and 2019 UECE awarded more than 3900 diplomas to students in master's and doctoral courses, with this number jumping from 55 diplomas in 2009 to more than 550 in 2018, as illustrated in Graph 2.

Graph 2: Number of Diplomas Granted for Master's and Doctoral Degrees (2009 to 2019).



Source: Own elaboration based on data from the "UECE in numbers" catalog.

In addition to graduate courses, there are several technological, scientific, and innovation development programs at UECE, and in 2017 there were more than 160 research groups registered in the Platform of the National Council for Scientific and Technological Development of the Federal Government of Brazil. Among these programs it is worth highlighting the "Program for Initiation in Technological Development and

Technological Innovation-PIBITI/CNPq", the "Scientific and Technological Initiation Program-ICT/ FUNCAP", and the "Institutional Scientific Initiation Program for Affirmative Actions-PIBIC-AF/CNPq". These numbers reflect UECE's research potential in society, mainly with the insertion of technological and innovation mechanisms.

One of the great achievements of the research promoted by UECE today is the development and production of the vaccine against Covid-19. In partnership with the State Government of Ceará and the Oswaldo Cruz Foundation (FIOCRUZ), and with UECE immunologist professor Izabel Florindo Guedes, the project consists of one more Triple Helix interaction. It is up to the university to provide the physical space and personal capital for the management, care, and safekeeping of the animals related to the vaccine's test phases, in addition to lectures on the care with Covid-19. The private initiative (FIOCRUZ) will provide the laboratory infrastructure for the execution of the research activities, and the Government of Ceará will provide the financial resources for the project's execution.

### *3.1.3 Service to students and inclusive and affirmative actions*

Linked to the Pro-Rectorate of Student Policies - PRAE, the assistance to UECE's students goes beyond the "walls" of the university since it promotes student assistance policies through inclusive and affirmative actions, and projects that try to reduce social inequalities. To this end, it relies on four axes, namely: Cell of Student Assistance (CAES); Cell of Affirmative Actions (CAA); Cell of Psychopedagogical and Health Care (CEPS); and Cell of Cultural Actions, Leisure, and Sports (CELA).

Each axis consists of building support mechanisms for students, for example, the Cell for Cultural Actions, Leisure, and Sports promotes actions that stimulate cultural events in the community, as well as encouraging university students to practice sports. In turn, CAES tries to guarantee the access and permanence of students in the university, aiming to reduce regional socio-economic inequalities: the Student Remaining Assistance Center, which seeks to encourage the academic performance of students in a situation of socioeconomic vulnerability through food grants, and residence and university restaurant; and the Work and Transport Scholarship Center, which, as the name suggests, grants financial incentives with scholarships mainly to newly enrolled students who fit in as low-income individuals.

The CEPS, also through two nuclei, identifies the basic health needs of the students and promotes projects that seek the university's cognitive improvement. For example, one of the objectives of the Center for Psycho-pedagogical Attention is to try to identify possible pedagogical problems that students may have. Besides this, the Center for Health Care Attention promotes, among countless other actions, projects in the field of sexual health and especially on the harmful use of drugs and alcohol.

The CAA-UECE develops affirmative practices through debates linked to the permanence of students in the public university. The Center for Social Inclusion, for example, promotes academic forums, develops access to computers, and develops projects aimed at lower-middle-class students. Another extremely important center is the



University Solidarity Center, which seeks partnerships for the development of actions in public schools and needy communities.

These affirmative and inclusive policies seek, through the State's intervening Helix, equal opportunities for all, trying to correct the community's socioeconomic deficiencies. For this, the UECE promotes theoretical activities such as the "Permanent Forum on Education and Ethnic Racial Diversity of Ceará", the "1st UECE Student Census", and the "Seminar on Affirmative Policies: Reflections on Access and Permanence at UECE", as well as practical attitudes such as exemption from entrance exam registration fees, and the "UECEVest", which is a study group to enter the university's courses.

### *3.1.4 Extension*

As part of the Pro-Rectorate of Extension - PROEX, the extension policy at the UECE has as references the university's General Regime and Management Plan, as well as the Brazilian National Extension Plan. The UECE tries to integrate teaching and research with the interests of society and the local community, involving institutions (public or private) in fundamental objectives, such as promoting technical and specialized knowledge to minority social groups, covering priority areas (health, education, diversity, environment, technology, among others).

There are several extension actions promoted annually by UECE, such as extension courses and projects, institutional and local community services, fairs, and study weeks, among others. Table 1 summarizes the extension activities developed at the university in 2019.

Table 1: Number of Activities and Extension Actions at UECE in 2019

<b>Activity/ Action</b>	<b>Beneficiaries</b>
Extension and Artistic Initiation Projects	137.157
Veterinary Hospital	21.420
Events	8.307
Extension courses	4.807
Language Center	3.250
UECEVest	1.937
Non-mandatory internships	492
<b>Total</b>	<b>177.370</b>

Source: Catalog "UECE in numbers" (2019).

As illustrated in Table 1, the extension activities promoted by UECE range from Scientific Initiation projects to Language Center and Veterinary Hospital. In 2019 alone, more than 175,000 people benefited, which does not refer only to students and employees. The UECE's extension projects serve the entire population, especially the needy community, in which a link is created between society and the university core and, consequently, promotes local socio-economic development.

One of the great actions promoted by the State Government of Ceará in partnership with the UECE was the creation of the Ceará University Hospital. Located on

the institution's campus, this action was planned by the Secretary of Health of the State of Ceará through the State Government's Health Modernization Platform, thus promoting a University-State association. With an investment of R\$275 million (approximately EUR 52 million) from the Government of Ceará, the building will have more than 650 beds, 7 floors, and a helipad for serious cases. This work, besides the importance of the University-State interaction, consists of a historical landmark of development and service to the local community.

### *3.1.5 Technological innovation*

The UECE's Technological Innovation policy, through the UECE's Technological Innovation Center (NIT-UECE), ensures licensing, patent registration, as well as commercialization of research and innovation prospectation. Starting in 2007, the NIT-UECE aims, among others, to facilitate the link between the university and society, through developed technologies and the propagation of innovation.

One of the mechanisms of UECE's innovation policy is incubation, in which since 1997 (two years after its creation) there was already a business incubator at the university, but only in 2011, has its regulation occurred. Created by Resolution No. 814-CONSU of September 29, 2011, the Business Incubator and Technological Development Center of the State University of Ceará - INCUBAUECE, aims to transform ideas coming from the university into sustainable and innovative enterprises, seeking socioeconomic development through technological innovation. For this, it offers countless services, such as business orientation, consulting, and training, and provides physical space for companies.

To better illustrate the numbers of this innovation center, the NIT-UECE signed, in addition to numerous lectures and services to the community, 31 cooperation contracts between the university and private enterprises in the period from 2010 to 2019. In 2019, for example, INCUBA-UECE served more than 30 potential entrepreneurs coming from the university and the local community. Moreover, despite the Covid-19 pandemic, partnerships were made in 2020 with the Municipal Government of Fortaleza, through the Municipal Secretariat for Economic Development - SDE, in which six companies were served in the incubation program, mainly in Biotechnology, in addition to other partnerships with universities, public institutes, government, and private initiative, thus forming the Triple Helix.

## **CONCLUSIONS**

This research aimed to present how the State University of Ceará proposes and behaves towards society, as well as analyze its role in regional development. For this, a brief history of the university was shown, and how the UECE currently behaves in matters such as social and economic responsibility, as well as statistical data of projects, programs, partnerships, and courses managed at the university. The methodology consisted in part of the theoretical framework available, and secondary data taken from

official documents, such as the Institutional Development Plan, Management Report, and the catalog "UECE in numbers", collected through the institution's website.

With the proposed work, it is noted that the UECE has been striving to contribute to regional development while bringing, from its mission, the principles, and values in respect of diversity and the environment, and the quest to reduce social disparity. The university participates in various ways in the socio-economic dynamics of the State of Ceará, either through the generation of employment and income, but also through the propagation of knowledge and technological advances.

The State University of Ceará is an entrepreneurial university, as it creates mechanisms to support innovation, technological development, and the entrepreneurial spirit of its students and faculty. In addition, the university is a fundamental part of the Triple Helix of Ceará, because through partnerships with the State Government and private initiatives it promotes programs and projects for society, through research, development of incubators, and inclusive activities. Therefore, it is concluded that the State University of Ceará is of great importance in terms of the development of the state-regional community.

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