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Sustainable Entrepreneurial University: basic elements

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Introdução
The concepts of entrepreneurship and sustainability are being studied together, especially in the field of management, due to the growing interest of organizations in these themes (Alfalih, & Ragmoun, 2020). Every organization, for-profit or non-profit, needs entrepreneurial skills to learn how to be sustainable, (Meek, & Gianiodis, 2023). Thus, this research aims to propose a framework of elements that underpin a sustainable entrepreneurial university and aims to answer the following research question: What basic elements are part of a sustainable entrepreneurial university?
Problema de Pesquisa e Objetivo
Thus, this research aims to propose a framework of elements that underpin a sustainable entrepreneurial university and aims to answer the following research question: What basic elements are part of a sustainable entrepreneurial university?
Fundamentação Teórica
The study by Apostolopoulos and Liargovas (2018) led to the conceptualization of a university of the ideal type, entitled Sustainable Entrepreneurial University (SEU), that is, Sustainable Entrepreneurial University (Figure 1), having as a principle the fulfillment of SDGs in an integrated way existing missions in the entrepreneurial university, considering that entrepreneurship can be a driver for the SDGs, agreeing with Lans, Blok and Wesselink (2014) and Wyness, Jones and Klapper (2015), who claim that education for entrepreneurship can lead to sustainability.
Metodologia
For this research, we used a single case study integrated with multiple units of analysis (Yin, 2015). A qualitative approach was adopted, which, in turn, has the natural environment as data collection site and descriptive character (Flick, 2009). As for the objectives, the research is characterized as descriptive that addresses the perceptions, expectations and suggestions of the field (Yin, 2015).
Análise dos Resultados
Created in 1934, USP is a public university, maintained by the State of São Paulo and linked to the Secretariat for Economic Development Currently, USP is responsible for more than 20% of Brazilian scientific production (USP, 2022). Unicamp was officially founded on October 5, 1966. Even in a recent university context, in which the oldest Brazilian university is just over seven decades old, Unicamp can be considered a young institution, which has already achieved a strong tradition in teaching, in research and in relations with society (Unicamp, 2022).
Conclusão
The objective of this study was to propose a framework of elements that underpin a sustainable entrepreneurial university and its developed practices, for which the question was answered: What basic elements are part of a sustainable entrepreneurial university? Based on the research findings, it was possible to verify that the analyzed universities are in a constant process of construction, seeking to become effectively entrepreneurial and sustainable.
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Palavras Chave
Sustainable Entrepreneurial University, Sustainability, Innovative Management

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Sustainable Entrepreneurial University: basic elements

Abstract
Building a sustainable entrepreneurial university is a challenge that requires an integrated approach committed to innovation, sustainability and entrepreneurship. The objective of the research proposes a framework of elements that underpin a sustainable entrepreneurial university. For this, cases of two renowned Brazilian universities were investigated: the University of São Paulo (USP) and the State University of Campinas (Unicamp), classified in the Ranking Universitário Folha (RUF), by the National Ranking of Entrepreneurial Universities and GreenMetric World as the best institutions in Brazil. Guided by the theoretical approaches of the entrepreneurial university and the sustainable university, this work has a qualitative approach and an integrated case study method with multiple units of analysis. In the data collection stage, 17 interviews were carried out with the aid of a semi-structured instrument to managers of the researched institutions. For data analysis, Atlas.ti software version 22 with content analysis was used. The findings originated tables for each of the institutions, resulting in a synthesis of the necessary elements for the construction of a sustainable entrepreneurial university. The results allow theoretical contributions through a conceptual framework, managerial contributions pointing to elements that underpin the construction of a sustainable entrepreneurial university and social contributions to the professional training of society. Limitations include interviews in a single state and the number of participants. As future studies, it is suggested that university entrepreneurial activities and activities aimed at sustainability be mapped in a larger number of cases.

Keywords: Sustainable Entrepreneurial University. Sustainability. Innovative Management. University Management.

1 Introduction

The concepts of entrepreneurship and sustainability are being studied together, especially in the field of management, due to the growing interest of organizations in these themes (Alfalih, & Ragmoun, 2020). To remain, organizations must be innovative and sustainable, showing entrepreneurial skills. Every organization, for-profit or non-profit, needs entrepreneurial skills to learn how to be sustainable, (Meek, & Gianiodis, 2023).

In this sense, considering that universities make a significant contribution to the development of society, they therefore assume a social responsibility, particularly with regard to training young people and raising public awareness of sustainability (Viebahn, 2002). Generally speaking, a sustainable university must "walk the talk" in relation to its sustainability agenda, that is, it must not only teach the concept and philosophy of sustainable development to its students, it must also be able to embrace the concept in organizational day-to-day, that is, sustainability must be part of university management and its operations (Carrera Sánchez, Partida Puente, Villarreal Villarreal, & Cantú Villarreal, 2021).

Moreover, the sustainable university, based on the development of teaching programs that incorporate concepts of sustainability, applied research and engagement with the community, must aim to train a new generation of professionals and citizens, committed to building a fairer, democratic and environmentally responsible society (Leal Filho, 2017). According to Shah, Shahjehan and Afsar (2019), to become a sustainable university, the institution needs to be prepared for change and, most importantly, understand the sustainability curriculum. At the same time, it is expected that the knowledge produced by universities and other research institutes will help solve social problems and crises and achieve sustainability goals more efficiently (Yildiz, 2021).

This university model is called the Sustainable Entrepreneurial University (SEU), a relatively new concept that combines academic tradition with entrepreneurial innovation and environmental responsibility (Meek, & Gianiodis, 2023). These universities seek not only to provide high quality education, but also to develop solutions to global sustainability challenges and act as leaders in their local and global communities, not least to foster sustainable entrepreneurship within universities (Shah, Shahjehan, & Afsar 2019).

Not least, it is relevant to evaluate the sustainable entrepreneurial university, both in relation to other educational institutions and in relation to the labor market, highlighting the importance of investing in sustainable and innovative practices to stand out in an increasingly aware world. and responsible (Liu, He, Lyu & Fang, 2018). Given this increasingly growing and responsible importance, it generates legitimacy for an infrastructure of sustainable entrepreneurship and bears fruit in new relationships and solutions (Etzkowitz, 2022).

Thus, this research predominantly focuses on the combination between entrepreneurship and sustainability, in addition to seeking an approximation with the Sustainable Development Goals (SDGs). It is important to investigate the challenges and opportunities faced by a higher education institution when it becomes a sustainable entrepreneurial university, how the university can reconcile the demands of the labor market with environmental and social needs, promoting the formation of conscious and responsible professionals.

Thus, this research aims to propose a framework of elements that underpin a sustainable entrepreneurial university and aims to answer the following research question: What basic elements are part of a sustainable entrepreneurial university?

2 Entrepreneurial and Sustainable University

The study by Apostolopoulos and Liargovas (2018) led to the conceptualization of a university of the ideal type, entitled Sustainable Entrepreneurial University (SEU), that is, Sustainable Entrepreneurial University (Figure 1), having as a principle the fulfillment of SDGs in an integrated way existing missions in the entrepreneurial university, considering that entrepreneurship can be a driver for the SDGs, agreeing with Lans, Blok and Wesselink (2014) and Wyness, Jones and Klapper (2015), who claim that education for entrepreneurship can lead to sustainability. It should be noted that interaction with industry is one of the pillars of the entrepreneurial university, as pointed out by Etzkowitz (2000, 2003a) and Lazzeroni and Piccaluga (2003), an element that creates an interface between the entrepreneurial and sustainable universities and is in line with the principles of HESI.

In this sense, the interface between the entrepreneurial and the sustainable university can also be seen through spending on Research and Development (R&D), which is one of the important elements that guide the transformation of universities towards the sustainable entrepreneurial university, stimulating academic research and commitment to the SDGs (Apostolopoulos, & Liargovas, 2018). This element is present in the activities of universities already called entrepreneurial (Gibb, Haskins, & Robertson, 2013; Borhani, Edalatian Shahriari, Kabaran Zadeh Ghadim, & Amiran, 2020), as well as challenges that involve maintaining the integrity of the university while interested in generating revenue from intellectual property and generating research results, with a focus on sustainability (Audy, 2006). Takala and Korhonen (2019) warn that, during the transition process to become an SEU, when meeting the SDGs by integrating economic, social and environmental responsibility into the missions of universities, there may be uncertainties in the management of institutions due to the lack of objective indicators to evaluate the new functions performed. Another relevant aspect is that universities must follow the Sustainable Development Goals (SDGs) defined by the UN - United Nations (Rasoolimanesh, Ramakrishna, Hall, Esfandiar, & Seyfi, 2023).

The SDGs are a global agenda for promoting sustainable development in all countries around the world by 2030 and are made up of 17 goals and 169 targets. Universities, as institutions that play a fundamental role in training professionals and producing knowledge, have the responsibility to contribute to the implementation of the SDGs in their teaching, research and extension activities. In addition, the adoption of the SDGs can contribute to building a sustainable entrepreneurial university, promoting the integration of sustainability with entrepreneurship and innovation (Sachs, 2015).

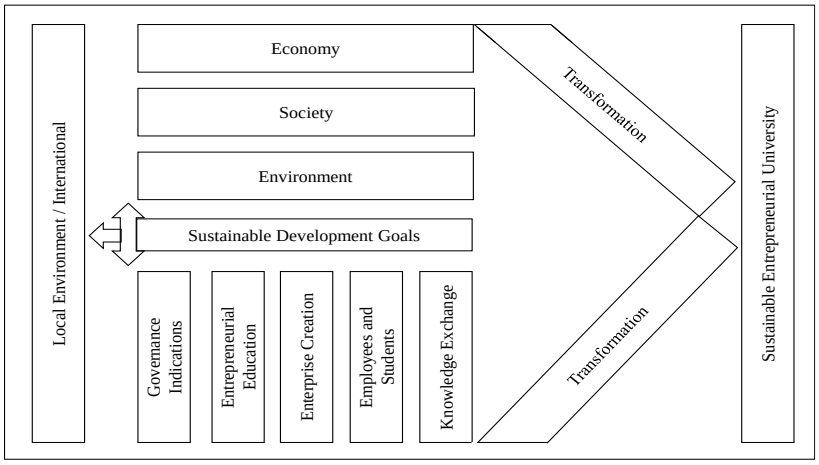

Figure 1- SEU *Framework*
Source: Adapted from Apostolopoulos and Liargovas (2018, p. 361).

According to Apostolopoulos and Liargovas (2018), there are tensions arising from the objectives of the entrepreneurial university, focused on the commercialization of knowledge and the generation of new sources of income, and the objectives of a sustainable entrepreneurial university, which promotes education for sustainable development in all your levels. These tensions could be mitigated, since Etzkowitz and Zhou (2008), in their proposed reorientation of the Triple Helix, predicted sustainability as a necessary element of the model. It is noteworthy that the flexibility that higher education institutions have in their research, offer opportunities for collaborative work, capable of dealing with SDG goals and knowledge transfers to the private sector (König, Suwala, & Delargy, 2021), aspects those that make it possible to reduce the internal tensions between undertaking and being sustainable.

Higher education can lead to sustainable transformation across society (Whitmer, Ogden, Lawton, Sturner, Groffman, Schneider, & Killilea, 2010). The university, through its actions and practices, is capable of promoting prosperity in the economy, society and environment (Apostolopoulos & Liargovas, 2018).

Thus, an entrepreneurial and sustainable university is a higher education institution that integrates entrepreneurship and sustainable development practices into its culture, teaching, research and activities (Etzkowitz, 2022). These universities recognize the importance of contributing to social, economic and environmental well-being and promoting innovation and responsible growth (Meek, & Gianiodis, 2023).

3 Methodological Procedures

For this research, we used a single case study integrated with multiple units of analysis (Yin, 2015). A qualitative approach was adopted, which, in turn, has the natural environment as data collection site and descriptive character (Flick, 2009). As for the objectives, the research

is characterized as descriptive that addresses the perceptions, expectations and suggestions of the field (Yin, 2015). Figure 2 presents the case and the units of analysis.

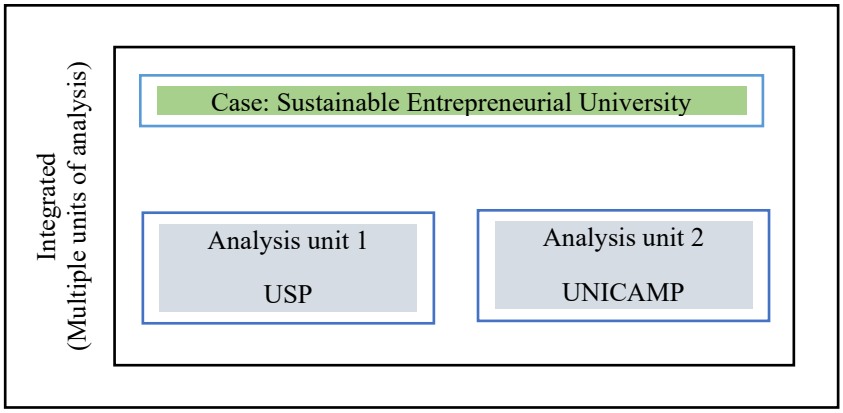

Figure 2 - Case and analysis units

As for the criteria for choosing the units of analysis, the rankings of entrepreneurial universities and sustainable universities that served as the basis for choosing the universities participating in this study were accessed. Ranking Brasil Júnior (2019; 2021), Ranking Universitário Folha (RUF) (2019) and UI GreenMetric World University (2020) were used by country. The University of São Paulo (USP) and the State University of Campinas (Unicamp) are ranked 1st and 2nd, respectively. Data collection for this research followed the guidelines of Flick (2009). Among these sources are: semi-structured interviews with university managers related to entrepreneurship and sustainability and institutional documents, database and study report.

In all, 25 participants were invited, of which 17 agreed to participate. The interviews took place between May and October 2022 and, for accessibility reasons, they were carried out using the google meet electronic tool. With prior authorization, the interviews were recorded and the terms of free and informed consent were signed. Subsequently, the interviews were transcribed, categorized and coded using the Atlas.ti software, version 22 (Table 1).

Table 1
Profile of respondents

		Local	Office	Time in the institution	Academic education	Interview duration	Written pages
USP	E1	Rectory	Teacher - Head Office of the Dean	25 years	PHD	1 hour and 16 minutes	18
	E2	INOVA	Lecturer - Entrepreneurship Center Coordinator	14 years	PHD	34 minutes	12
	E3	AUSPIN	Lecturer - Entrepreneurship Center Coordinator	11 years	Doctor	37 minutes	28
	E4	AUSPIM	Innovation Agent	19 years	Masters	1 hour and 02 minutes	38
	E5	Overcome Park	Administrative Advisor	6 years	MBA	48 minutes	10
	E6	Overcome Park	Innovation Center Coordinator	10 years	Masters	38 minutes	19
	E7	Overcome Park	Innovation Agent	16 years	Doctor	54 minutes	19
	E8	Institute of Biosciences	Teacher - Director	16 years	PHD	33 minutes	11

To be continued

		Rectory	Senior Assistant to the Dean				
	E9	Environmental Management Superintendence	Teacher the Sustainability Committee of EESC	16 years	PHD	34 minutes	18
UNICAMP	E10	INOVA	Teacher - Associate Director	17 years	PHD	54 minutes	33
	E11	INOVA	Park and Incubator Manager	12 years	Doctor	37 minutes	6
	E12	INOVA	Director of Institutional Relations	17 years	Doctoral student	1 hour	14
	E13	Executive Board of Integrated Planning	Teacher -Coordinator	20 years	PHD	35 minutes	13
	E14	Extension Board	Teacher - General Coordinator	25 years	PHD	32 minutes	15
	E15	Executive Board of the Sustainability Coordination	Architect and Urban Planner - Coordinator	7 years	Doctor	36 minutes	15
	E16	Sustainability Coordination	Civil engineering	10 years	Masters	42 minutes	27
	E17	Sustainability Coordination	Civil engineering	14 years	Masters	21 minutes	12

Source: Research data

The research questions were structured according to Clark's studies (1998; 2004); Etzkowitz and Leydesdorff (2000); Etzkowitz (2000; 2004; 2013); Guerrero et al. (2006); Urbano and Guerrero (2013); Salamzadeh et al. (2011); Sooreh et al. (2011); Organization for Economic Cooperation and Development (OECD, 2012); Ruiz (2018); Borhani et al. (2020), and Liu and van der Sijde (2021) and metrics from the International Economic Development Council (IEDC, 2017).

Regarding the ethical issues of the study, it was forwarded to the Research Ethics Committees of the Universidade do Oeste de Santa Catarina (UNOESC), under registration CAAE 57435622.0.0000.5367. USP, under registration CAAE 57435622.0.3001.5564 and UNICAMP, under registration CAAE 57435622.0.3002.5404. After evaluations, the project was approved by all committees.

Data were analyzed using the content analysis technique (Bardin, 2011). Thus, data interpretation took place in three stages: pre-analysis: data organization and floating reading of the data; exploration: categorization and coding of data; and treatment of results: interpretation of data.

For this step, Atlas.ti software version 22 was used. All research material, which could be downloaded, was inserted into the system for further treatment, systematization and analysis. After manual coding, in addition to the previously defined categories, new categories and elements of analysis emerged from the research data. Using the software, the results were organized into folders and networks.

4 Data Presentation and Analysis

4.1 Analysis Unit – USP

Created in 1934, USP is a public university, maintained by the State of São Paulo and linked to the Secretariat for Economic Development. The talent and dedication of professors,

students and employees have been recognized by different world rankings, created to measure the quality of universities based on various criteria, mainly those related to scientific productivity (USP, 2022).

This performance, generated over more than eight decades of an intense search for excellence, allows USP to integrate a select group of world-class institutions. Currently, USP is responsible for more than 20% of Brazilian scientific production (USP, 2022).

Table 2
USP characteristics

University of Sao Paulo	
Acronym	USP
Type	State
Foundation	1934
Location Headquarters	Butantã, São Paulo – SP
Campi	8
Teaching and research units	42
Number of undergraduate courses	340
Number of graduate courses	264
Number of Students	97.000
Number of Teaching Servers	5.380
Number of Technical Servers	13.360
WebSite	https://www5.usp.br/

Source: Depar - Partnership development office USP (2023)

With the aim of presenting the basic elements, as well as the difficulties pointed out by the interviewees for the university to become entrepreneurial and sustainable, tables were prepared with notes. Thus, Table 3 presents, in summary, the notes of the interviewees at USP.

Table 3
Basic elements, challenges and difficulties to become a sustainable entrepreneurial University – USP

Source	**References**
E1	"So, a sustainable university depends on two central movements and a third movement that would be a movement, let's call it operational. p.1 You would have to have a sustainability policy and, in this sustainability policy, establish the actions to be carried out and the goals to be achieved, not necessarily all at the same time, but what you are going to do first, second, third and so on, and you pass to apply this to their day-to-day activities." p.1 "From the campus itself, so that you can see how water supply, sanitary treatment, and waste management are being dealt with. How do you dispose of this waste? How do you solve it? the problems, having afforestation, what care do you take with it. How do you treat domestic animals, if they appear on campus? And within all that we are talking about, how does mobility take place of students, teachers, civil servants with policies that, even eventually, have made it possible to encourage public transport, to use bicycles and so on." p.1 "A scaling. It's a role like the thing you build gradually." p.2 "A second movement is for you to put this into teaching." p.4 "We implemented an institutional program that spoke of the Sustainable Campus, and it was developed on this campus in the capital and also on several other campuses. And, the way it was developed, it managed to take a lot of that to the seminars that were held with the Units. But it's that old story, if you stop for a while, it starts to regress again. Then you have to do it again and so on, continuing the actions that never end." p.5
E2	"It has a lot of rank, a lot of rank. This makes the university's ranking go up, but whether this will reach the top, I don't know, this is an obstacle." p.1 "One obstacle is that USP's innovation policy has yet to be created." p.1 "There is a lack of a system of rewards in favor of entrepreneurship." p. 6

To be continued

E3	"I pose the issue of solutions to problems that are always linked to one of the 17 Sustainable Development Goals. The university did not consider this metric, and we started to be charged a couple of years ago. And now, on my initiative, we have put it everywhere I'm going as a solution." p. 24 "Understanding the complexity of this world of intellectual property. So there is a vacuum there. It is an institutional barrier, a communication barrier, a knowledge barrier. The researcher is very lacking in this information." p. 3 "There is a big hole, another huge valley, which is that of communication between the researcher and whoever is in the market. The researcher's vision is science and the market's vision is business. This lack of communication, the need for a curatorship. The university has the impression, it assumes that the market wants to appropriate its wealth. And the market has the impression that the university is incompetent. We need to resolve this issue." p. 7 "The university doesn't know how to connect with the market yet, largely because of the lack of this culture of communication. And then there are problems that are not solved and the university doesn't know how to solve it." p. 9 "The first thing, the researcher has to know that he cannot work alone. Second, that he needs someone to do the financial management, he needs to know someone who understands business management. So this is important, he needs to know that he's not the God he needs other people, that no one makes the Empire alone." p. 16 "Our regulation is very late, right? Because the court of accounts, the attorney's office that are deciding there, is still very heavy-handed, if the researcher is in a startup, he can be penalized. So, there is a very bureaucratic regulation, and beyond that, it penalizes." p. 17 – 18
E4	"I see that there is a misrepresentation of what to undertake in general." p. 16 "And I think institutions don't prepare for bankruptcy, right? So, somehow, it should not focus only on the vision of success, which is the media's vision. There is very successful entrepreneurship, but the university could play a role better if it focused on a slightly more realistic vision, also showing that there is failure and that it is part of, of the trajectory, even for the mistakes, and success up front yes, isn't it? Preparing future entrepreneurs." p. 18 "It is an issue that is still controversial, let's put it that way. It is not a consensus of the entire university to have entrepreneurship within the institution's mission." p. 21 "Perhaps the main bottleneck is the cut in resources. Here in Brazil, unfortunately." p. 27 "The question of the development of traditional research that you will hear from everyone is that there is a legal problem, that there is a bureaucratic problem, that the institutions are bureaucratic, that the attorney's office gets in the way. true, to a certain extent, but I would say that the main problem is that you don't have support on these administrative and technical matters. Usually everything is centralized. The researcher assumes all responsibility for this. And he doesn't know how to do it." p. 27
E5	"There is this difficulty among researchers to understand, people are very uninformed about this process, they come, sometimes wanting to do it, but they don't know anything." p. 2 "We have all this bureaucracy." p. 5 "Obstacles we have, I think they are the regulatory issues themselves, right? It ends up being a major obstacle." p. 8 "What is still needed is a change in culture. Not only students, but teachers also need to embrace more, you know, the issue of entrepreneurship, if you notice an absurd intellectual production in Brazil, there are many articles and then there are patents, but yeah, we need to observe the outside environment more." p.10
E6	" It will necessarily go through a change of mentality". p. 10 "The main obstacles we have to deal with here are exactly breaking down taboos in terms of the entrepreneurial mindset. This is the first thing to do." p. 11 "It's the lack of knowledge in business management, for example, in the health area. So that's an obstacle." p.11 "Qualifying in terms of business management an individual who, within the scientific field, is already extremely qualified. Many talk about the issue of financial resources, which I, particularly, do not see as an obstacle." p. 12
E7	"I think this issue of internalizing innovation in the various teaching and research units is still lacking." p. 11 "There are still obstacles in the cultural issue, it is very important. I also see this greater need for integration." p. 15 "One thing that is missing, not only at the university, but I speak in terms of the government itself at any level, is the lack of having a master plan with defined policies, because then, no matter how much managers change, you will have that line master, who will continue the development. And today these

	management changes without continuity of plans are very harmful. You are doing one thing, suddenly, among other management and for everything. And then, let's do other things and like, that that had already been done by people, they don't analyze whether it's being good. This is a difficulty." p. 16 "Everyone had to be fighting together for the same goal. We have to cooperate. Because nobody does anything alone, actions happen in this exchange of ideas. Having that, then you encourage and generate it, right? It is the result of the impact is greater, So, I think we have to look at the result." p. 17 "The agreements to be processed quickly, there are already models, there is an agreement portal, there are models already approved by the attorney general, and the flow has improved a lot. However, I still think that we can reduce bureaucracy even more and be more agile and that is necessary for the generation of innovations" p. 12
E8	“This I consider a great challenge, which is the challenge of cultural change. " p. 3 “Very few people are aware of the Sustainable Development Goals. In fact, they have heard about it, but they don't know it." p. 3 "Putting it into practice, which requires the entire management there. You actually collect the indicators.” p. 3 “Managers will probably have to be re-educated to learn systemic management in order to work on sustainability. " p. 3
E9	"The hardest thing is actually bringing these people into this movement." p. 9 "But, if we don't engage people, things don't happen at the necessary speed." p. 9 "Students are not arriving here at the university with the awareness, with the commitment they should have, learning since childhood." p. 10 "Awareness of the academic community of a university like Unicamp is our biggest challenge. And, in society as a whole, it's not even said, no". p. 10 "Giant challenge also in relation to curriculum modernization". p. 11 “Resistance to change. People are always resistant to change. I think this is the first difficulty you have. " p. 13 "Resources. You need an initial investment. This initial investment, later, ends up returning, but this initial investment, it is fundamental." p. 13

4.2 Analysis Unit – Unicamp

Unicamp was officially founded on October 5, 1966. Even in a recent university context, in which the oldest Brazilian university is just over seven decades old, Unicamp can be considered a young institution, which has already achieved a strong tradition in teaching, in research and in relations with society (Unicamp, 2022).

Accounting for 8% of academic research in Brazil, and 12% of national graduate studies, Unicamp maintains leadership among Brazilian universities, in terms of patents and the number of articles per capita published, subsequently, in journals indexed in the database. ISI/WoS.

Table 4
Unicamp characteristics

Campinas State University	
Acronym	Unicamp
Type	State
Foundation	1966
Location Headquarters	Campinas – SP
Campi	3
Teaching and research units	66
Number of undergraduate courses	153
Number of graduate courses	34
Number of Students	1.708
Number of Teaching Servers	6.835
Number of Technical Servers	https://www.unicamp.br/unicamp/

In 2017, Unicamp implemented tools to prepare its strategic planning, ensuring that strategic management was effectively incorporated into the institution's university

management. In this implementation, actions have already been aligned with the 2020-2030 Sustainable Development agenda and several projects related to the theme have also been implemented.

In an improved way, the institution prepared the 2021-2025 planning, starting a new cycle of planning, execution and evaluation, and consolidating the interface between Planning and Institutional Evaluation. (DOC12), in addition, by linking each Strategic Objective to the Sustainable Development Goals (SDGs), it unequivocally demonstrated institutional commitment to sustainable development. Table 5 presents the interviewees' notes on the present basic elements and challenges to become an entrepreneurial and sustainable university.

Table 5
Basic elements, challenges and difficulties to become a sustainable entrepreneurial university - Unicamp

Source	References
E10	"It's the difficulty in contracting services, works." p. 25 "It takes time, it's expensive. The quality doesn't come ou.t" p. 26 “Having issues of ESG- Environmental, social and corporate governance at the University.” p. 21 “Having established criteria for measuring Sustainability.” p. 22 "It is a subject that is being talked about a lot. We are still in our infancy in the actions of, for example, what we are trying to do is to raise ESG issues at the University." p. 21 "We still don't have well-established sustainability criteria." p. 22 "So, we still have a way to go. We have already started to walk, but we still have a lot to evolve. It is a very recent area that is happening, in the sense of inclusion. And bringing this into practice is a challenge.” p.22
E12	"So, the availability of resources from companies to carry out research would be an obstacle. Because, if you look at the composition of the resources that come in, external resources that come in for research at Unicamp, most come from exclusivity clauses and not from obligation." p. 2 "In the United States, there is money for research, but we know that this is due to a movement in the preference of large companies, to carry out research at the headquarters. But this would be an obstacle for Brazil, for research in university-company partnerships, greater availability of resources that belong to the company itself "p. 2
E15	"It's also important to say that you have to have sustainability indicators to understand how, in fact, the university is being sustainable and how and where to start improving." p. 10 "It's important to have a guideline, to have indicators. That's when we started with the Green Metric; we needed to know in the master plan how we were doing and we didn't know. We didn't have a diagnosis from Unicamp. So we the metrics began so that we have our own diagnosis, we know our own indicators." p. 10 "We are in search, and I think that is why we have the goals of sustainable development as our guide." p. 10 "It's a challenge. I think this engagement is one of the main ones." p. 5 "On an internal level, the main challenge was the visibility that was necessary for the university to be sustainable, when this was not even considered within the university. And then, it is the support of senior management." p. 5 "When we start to develop the projects and start to need the budget. That the top management needs to release the budget. So that was the main obstacle, like how is it organized?" p. 5 “Sustainability needs to be a transversal theme. Many professors don't even know what the SDGs are, so there's this part of bringing sustainability to an academic level, as an institutional guideline.” p.8 “On an operational level, having a departmental structure, a board closer to senior management." p. 9 "And it still is today. We have an obstacle that is the following: there is sustainability that is understood at an academic level, and there is sustainability that is at an operational level. But, to work with the indicators, at some point, we need to bring these two issues together, the academic and the operational ones. In the sustainability coordination, we work only with the operational ones, because we understand that the academic ones are another scope. But then, another internal group emerged that works on sustainability, directly linked to the dean's office, and there is a dispute, how far each group goes. Today, a major internal obstacle is who is responsible for what." p. 5

To be continued

	"We needed money to carry out the projects, and that money did not fit into the accounts that exist at the university; in terms of expenses, there is no account called sustainable." p. 7 "We have the 20th and 30th as a deadline to achieve the SDGs, with the deadline for us to be a zero carbon university as well, 2030 is coming, and decarbonization is a long way off". p. 10
E16	"Mobility and Accessibility. We also have an electric bus and it's free." p.2 "We are already listed in the part of the Sustainable Development Goals." p. 4 “We have a legal understanding and, often, these companies are not interested due to the bureaucracy and end up not participating in bids”. p.7

4.3 Data Crossing

It is noticed that, even though the universities surveyed are considered entrepreneurial, the notes, and mostly by USP, still highlight several aspects that hinder the development of entrepreneurship in universities, including: change of mentality, breaking taboos regarding entrepreneurship , misrepresentation of what to undertake, the cultural issue pointed out emphatically. This perception is in line with what Clark (1998) states when he defends the development of an integrated and engaging entrepreneurial culture as an element present in an entrepreneurial university. Other highlights are: lack of knowledge and qualification in business management; existence of a communication barrier, mainly between the researcher and the market; to transform inventions and research into innovation. In this sense, Salamzadeh, Salamzadeh, & Daraei (2011), reinforce that the promotion of innovation must occur through incubators, technology parks and networks, structures that drive development. In the same sense, Fernández-Nogueira, Arruti, Markuerkiaga, & Sáenz (2018), point to innovation as an essential factor, which must be present, and the challenges for its development must be overcome.

Other aspects, still identified as difficulties, are the long overdue regulation, excessive bureaucracy, the lack of a support infrastructure closer to the researcher, a master plan with defined policies and greater availability of company resources to carry out research at the university. Regarding the need to have flexible structures, Guerrero, Cunningham, & Urbano (2015) and Rasmussen, & Lindgren, 2021), define this need as an important point in building an entrepreneurial university, as well as a governance structure focused on entrepreneurship .

Finally, becoming an entrepreneurial university can be a complex challenge that requires a significant change in culture and institutional strategies. Therefore, one of the main challenges and difficulties faced by universities that seek to become entrepreneurs includes cultural change, that is, it is necessary to change the organizational culture, valuing, instead of tradition and bureaucracy, creativity, innovation and collaboration, and providing the engagement of the academic community, with an emphasis on the fact that the search for the promotion of entrepreneurship and sustainability needs to be a priority of the institution (Liu, He, Lyu, & Fang, 2018; Schaper, 2019; Etzkowitz, Dzisah, & Clouser, 2021).

Regarding the sustainable university, the interviewees indicate that the university, to be sustainable, among its elements, needs to: have a new governance, implement ESG, develop a new culture; create institutional sustainability policy; have a strategic plan with indicators; include the theme of sustainability in teaching; create institutional program for sustainable campus; carry out continuous actions in order not to regress; having sustainability as an evaluation criterion for projects; take care of the basic elements that are energy, water supply, sanitary treatment, waste management, afforestation, domestic animals, mobility of students and employees; having an attentive look at diversity, inclusion and student permanence; making the campuses living laboratories and, in a very forceful way, working with the UN sustainability agenda, including the SDGs in institutional activities.

Universities must carry out their activities both in promoting sustainability and in training professionals capable of facing the environmental, social and economic challenges of

the 21st century (Sachs, 2015). Regarding the challenges to compose a sustainable university, the reports, similarly among universities, point out the following aspects as preponderant criteria: regression in actions due to lack of continuity and attention; cultural change, as people are resistant to change; curriculum modernization; practical implementation of the developed plans; lack of knowledge by the academic community of the SDGs; collection of indicators; training of managers; engagement of people in the movement for sustainability; students who arrive at the university unaware of what sustainability is; awareness of the academic community and society as a whole; investment resources; posing ESG issues at the University; senior management support; departmental structure; specific board for sustainability, closer to senior management; bureaucracy; and developing a strong policy for sustainability. It is noticeable that the challenges are precisely points listed as necessary elements to compose a sustainable university, emphasizing and confirming the results found.

Related to the challenges, Ramaswami, Weible, Main, Heikkila, Siddiki, Duvall, and Bernard, (2012) and Rasmussen, Einar, Lindgren, and Monica (2021), point out that few campuses develop carefully; more often than not, change is the product of ad hoc decisions made at many different times, in many different places, with little or no consideration for the whole. Infrastructures are substantially fixed, practical and fragmented.

In the same line of thought, Lipschutz, Wit and Lehmann (2017) describe that it is necessary to transform university campuses into sustainable entities, instead of just institutions with sustainability projects, thus offering models and programmatic practices that can, in the future, be applied. A good starting point is to ensure that the entire university community is involved in building a sustainable campus and has a voice in dialogue and decision-making. It is important to ensure that your message is not just about 'green' issues, but also includes social and financial aspects. This will broaden the range of people who see sustainability as relevant and useful to them.

The researched institutions defend the establishment of actions that transform and maintain sustainable entrepreneurial universities, incorporate in the speeches the need for a strategic planning that seeks curricular reformulation and structures both for entrepreneurial practices and for sustainable practices, they defend that the researches need to take considering the demands of society and also of the market, that is, that universities need to invest in providing responses to the external environment.

New roles are attributed to the university, such as entrepreneurship, with a focus on social issues and sustainability, with a focus on the environment; it was possible to identify in the plans of the two institutions that both placed sustainability among their guiding principles, as well as the concern with promoting a culture of innovation and entrepreneurship through the creation of mechanisms to stimulate and support the entire academic community in favor of the main activities from the University.

It was evident the recognition by the top administration of the universities, the institutional commitment to sustainable development and the challenge arising from this commitment, especially with regard to meeting the greatest possible number of sustainable development objectives, a context in which both universities claim that they have acted emphatically and at all levels, seeking to overcome the weaknesses that still exist in this field.

The results show the participation of the researched universities (USP and Unicamp) in local and national development, and, perhaps, international development. Both institutions recognize their role in local development, recognize the importance of partnerships established with other higher education institutions, with the government and with the productive sector, focused on solving society's problems, insertion and participation in local innovation systems, thus corroborating the claims of Etzkowitz (2000), Shah, Shahjehan, & Afsar (2019) and Carrera Sánchez, Partida Puente, Villarreal Villarreal, & Cantú Villarreal (2021).

The experiences developed at USP and Unicamp are related to mechanisms and strategies in the area of entrepreneurship, innovation and sustainability, in line with models incorporated in developed countries. In this sense, even though there is still a long way to go to reach high levels of results, at the level they are, the two institutions surveyed manage to provoke an intense approximation with society and the demands of the market, not disconnecting their social functions and their pillars of teaching and search.

4.4 Framework

For the composition of the framework, the crossed results of the studied cases were analyzed. figure 4 presents the vision of the whole with the axes and the necessary elements that contemplate a sustainable entrepreneurial university.

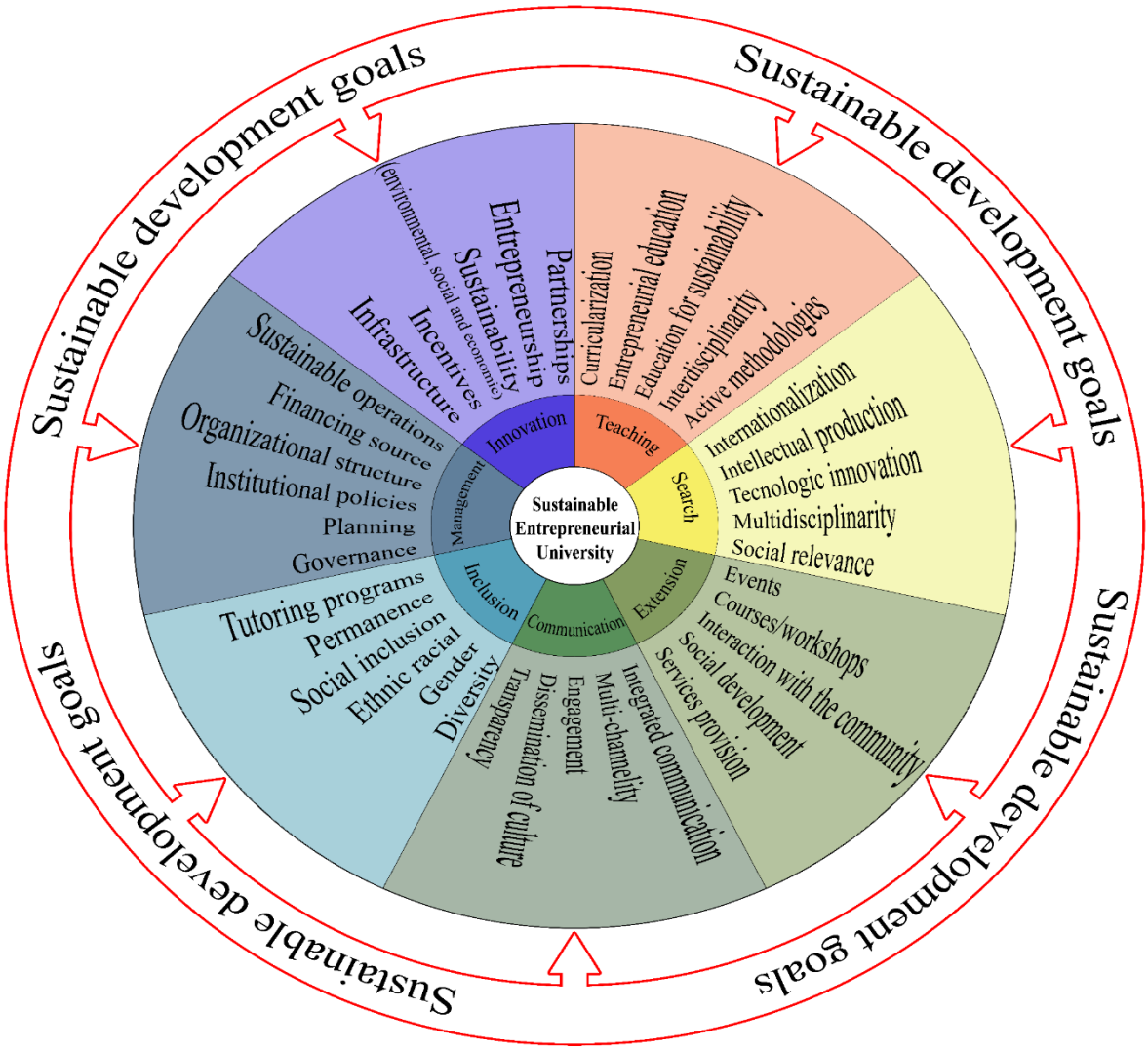

Figure 4 - Sustainable Entrepreneurial University Framework

The proposed framework integrates the predominant categories in the research, these drawn in axes/dimensions: teaching, research, extension, innovation, inclusion and communication, each axis includes sub dimensions that describe specific characteristics, that is, elements that compose them. The SDGs appear as guides for all categories and subcategories.

5 Conclusions

The objective of this study was to propose a framework of elements that underpin a sustainable entrepreneurial university and its developed practices, for which the question was answered: What basic elements are part of a sustainable entrepreneurial university?

Based on the research findings, it was possible to verify that the analyzed universities are in a constant process of construction, seeking to become effectively entrepreneurial and sustainable. Although the researched universities do not always offer immediate and satisfactory answers to these demands, they have been undergoing an adaptation effort in order to adjust themselves, more and more, to the current context.

Building a sustainable entrepreneurial university is a challenge that requires an integrated approach and a commitment to innovation, sustainability and entrepreneurship. To build a sustainable entrepreneurial university, it is necessary to maintain an entrepreneurial culture, with committed leadership, supporting infrastructure, encouraging research and sustainable innovation, in addition to strategic partnerships and engagement with the Sustainable Development Goals (SDGs).

In short, a sustainable entrepreneurial university is one that seeks to develop an entrepreneurial culture among its members and incorporates sustainability principles into its activities. This concept combines the ideas of entrepreneurship, innovation and sustainability, and seeks to create an environment conducive to the generation of knowledge and the transformation of ideas into sustainable solutions.

The sustainable entrepreneurial university must be an institution engaged with society and contemporary socio-environmental challenges, seeking to create innovative and sustainable solutions that can contribute to building a more just, democratic and environmentally responsible society. It is important to emphasize that the construction of a sustainable entrepreneurial university is not an easy process, which requires time, resources and collective effort.

As practical contributions, it includes the development of guidelines for the implementation of entrepreneurial and sustainable practices in universities. A sustainable entrepreneurial university can contribute to the formation of highly prepared professionals, capable of developing innovative and sustainable solutions, as well as to the generation of knowledge and technology that can be applied in Society.

For managerial contributions, the study presents the elements that underpin the construction of a sustainable entrepreneurial university. This includes creating an environment that encourages innovation, establishing strategic partnerships with companies and other organizations, promoting entrepreneurship programs and implementing sustainable management practices. Furthermore, the integration of the UN Sustainable Development Goals (SDGs) can help universities align their activities with global demands for sustainable development.

This study is socially relevant because it contributes to the training of qualified professionals committed to sustainable development, capable of proposing innovative and sustainable solutions to face challenges that affect global society. The university is an institution that exerts great influence on society, whether in the training of professionals, in the generation of knowledge or in the promotion of innovation and entrepreneurship.

The main theoretical contribution was the construction and development of the conceptual framework that addresses the fundamental elements to help the understanding and implementation of a sustainable entrepreneurial university, this study sought to advance, therefore, in the area of knowledge that interconnects university entrepreneurship and sustainability, allowing managers, academics and other stakeholders to better understand the characteristics, challenges and benefits of this university model.

As for the limitations of this study, first, the fact that the study interviews were limited to the state of São Paulo, with two public universities participating, even though they are considered references and at the top of academic rankings, this is considered a limitation. In this situation, there are probably several private and public universities, which have also developed entrepreneurial and sustainable activities and could contribute to this study. Second, not all the people invited to participate accepted and, therefore, it was not possible to obtain a complete picture of the activities of all divisions of the organizational structure that develop entrepreneurial and sustainable activities in the institutions.

In order to overcome these limitations, it is suggested that future studies map university entrepreneurial activities and activities aimed at sustainability in a larger number of cases, that is, of participating institutions, carrying out comparative studies between different universities, analyzing their practices, their management models, results and social and environmental impacts.

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