

FROM THE CLASSROOM TO THE ENTREPRENEURIAL ECOSYSTEM: INTERNATIONAL PRACTICES FOR STRENGTHENING ENTREPRENEURIAL EDUCATION IN BRAZILIAN TECHNOLOGICAL HIGHER EDUCATION

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Summary

This study analyzes entrepreneurial education practices identified in Portuguese higher education institutions, seeking to understand how these experiences can contribute to strengthening entrepreneurial training in Brazilian technological higher education. The research adopts a qualitative approach, exploratory and descriptive in nature, with elements of participatory research, and is based on an academic immersion carried out in Portugal, involving participant observation, technical visits, dialogue interviews, institutional interactions, and document analysis. The records produced during the experience were subsequently revisited and organized into six analytical dimensions: experiential learning; curricular integration and interdisciplinarity; student protagonism; teaching performance; articulation with the entrepreneurial ecosystem; and internationalization and network formation. The results show that the observed practices go beyond the isolated offering of content on entrepreneurship and are characterized by the articulation between practical experiences, curriculum, student participation, teaching performance, and interaction with innovation environments. The main contribution of this study lies in identifying a logic for integrating entrepreneurial experiences, suggesting that strengthening entrepreneurial education depends less on the quantity of initiatives offered and

more on the institutional capacity to connect them throughout the student's educational trajectory. It concludes that international experiences can constitute important references for the Brazilian context, provided they are critically analyzed and adapted to the institutional, cultural, and educational particularities of technological higher education.

Keywords: entrepreneurial education; technological higher education; experiential learning; entrepreneurial ecosystem; internationalization; student leadership.

1. Introduction

Entrepreneurship has assumed increasing economic, social, and educational relevance, traditionally associated with the creation of companies, job creation, innovation, and socioeconomic development (Aiub , 2002; Schaefer & Minello , 2016; Huq & Gilbert, 2017; Marshall & Gigliotti , 2018). However, its contemporary understanding goes beyond the creation of new businesses, also encompassing entrepreneurial behaviors developed within organizations and initiatives of a social, environmental, and collaborative nature (Foucrier & Wiek , 2019; Bogatyreva , Laskovaia , & Osiyevskyy , 2022; Geradts & Alt, 2022).

The economic, technological, and professional transformations of recent decades have also led to changes in the skills required of students and future professionals (Zhang et al., 2020). In this context, higher education institutions play a relevant role in training individuals capable of identifying opportunities, developing innovative solutions, and acting entrepreneurially in different professional environments. Consequently, higher education has increased its focus on developing entrepreneurial skills and creating conditions that stimulate students' intention and willingness to become entrepreneurs (Longva et al., 2020).

This change represents an expansion of the function traditionally attributed to higher education institutions. While historically a significant part of university education has been geared towards preparing students for entry into the job market as employees, entrepreneurial education has come to occupy an increasingly prominent space in curricula and academic practices, seeking to stimulate entrepreneurial attitudes and intentions among students (Laviere , 2010; Chien-Chi et al., 2020). The growing

scientific production on academic entrepreneurship and entrepreneurial education also demonstrates the consolidation of this field of research (Chen, 2018; Fellnhöfer, 2018; Fernández-Pérez et al., 2019; Liu et al., 2019; Tang & Zhang, 2018).

Despite this progress, entrepreneurial education remains surrounded by challenges related to the ways in which entrepreneurship should be incorporated into the educational process. Kuratko (2005) already pointed to the emergence, trends, and challenges of entrepreneurial education, while studies developed in the Brazilian context have identified opportunities for improving this training (Lima et al., 2015; Lopes, 2017; Lopes & Lima, 2019). In this debate, Schaefer and Minello (2016) highlight the importance of the premises, objectives, and methodologies of entrepreneurial education, while Araújo and Davel (2018) advocate for a closer connection between the contributions of the field of education and studies on entrepreneurial education.

This perspective allows us to understand entrepreneurial training as a process that should not be limited to the transmission of knowledge about starting or managing businesses. Developing an entrepreneurial mindset involves experiences capable of stimulating skills, autonomy, creativity, opportunity identification, and the ability to act in real-world situations. Studies have linked entrepreneurial education to the development of self-efficacy and entrepreneurial intention (Fernández-Pérez et al., 2019; Liu et al., 2019), while Longva et al. (2020) demonstrate that educational experiences related to entrepreneurship can also constitute spaces for reflection on students' own professional choices.

In this sense, it becomes relevant to understand not only **whether** institutions offer entrepreneurial education, but mainly **how** this training is carried out. Different pedagogical and institutional strategies can bring students closer to entrepreneurial experience, including practical activities, projects, interaction with companies, development of business ideas, events, mentoring, and engagement with innovation environments. This concept finds support in the need to bring education and experience closer together in the study of entrepreneurial education, as discussed by Araújo and Davel (2018), and broadens the understanding of the educational process beyond the classroom.

Collaboration between educational institutions from different countries also represents a possibility for enriching this process. The exchange of experiences allows students, teachers, and researchers to come into contact with different perspectives, methodologies, and business contexts, broadening their understanding of the challenges and opportunities related to entrepreneurship. International collaboration can, in this sense, foster innovation, creativity, and critical thinking—skills relevant to entrepreneurial activity in an increasingly interconnected environment (Redford, 2024).

This perspective becomes especially relevant when considering the cultural and institutional differences that exist between countries. Previous studies demonstrate that cultural context influences entrepreneurial behavior (Tan, 2002; George & Zahra , 2002), which has contributed to the development of *cross -cultural research* aimed at understanding how cultural and institutional characteristics can influence initiatives and behaviors related to entrepreneurship (Lumpkin & Dess , 1996; George & Zahra , 2002; Busenitz & Lau , 1996). Thus, international experiences can constitute important sources of learning, provided they are analyzed considering the particularities of different educational and institutional contexts.

It was in this context that an academic immersion experience in Portuguese institutions allowed for the observation of different strategies focused on entrepreneurial training. The experience involved institutions such as the University of Porto, the School of Business Sciences of the Polytechnic Institute of Viana do Castelo (ESCE-IPVC), and the University of Lisbon, encompassing contact with teachers, students, managers, innovation environments, incubators, and initiatives supporting entrepreneurship. The purpose of the experience was to learn about entrepreneurial models and practices and to identify elements capable of contributing to the improvement of entrepreneurial training strategies in the Technology Faculties of the Centro Paula Souza.

The experiences carried out indicated the presence of practices that go beyond the conventional offering of content on entrepreneurship and involve hands-on learning, project development, interaction with external agents, interdisciplinarity, and closer ties between the university and the entrepreneurial ecosystem. These characteristics suggest the need to analyze entrepreneurial education from a broader perspective,

considering the articulation between pedagogical practices, academic experiences, and institutional mechanisms that support entrepreneurship.

Although the literature acknowledges the growing importance of entrepreneurial education, it remains relevant to deepen the understanding of how practices developed in different institutional contexts can provide references for improving entrepreneurial training in Brazilian higher technological education. In this sense, the analysis of international experiences does not imply the direct reproduction of foreign models, but the critical identification of practices and principles that can be considered in light of the characteristics and needs of the Brazilian educational context.

Given this problem, the following research question is established: what entrepreneurial education practices identified in Portuguese higher education institutions can contribute to strengthening entrepreneurial training in Brazilian technological higher education?

Thus, the objective of this study is to analyze entrepreneurial education practices identified in Portuguese higher education institutions, seeking to understand how these experiences can contribute to strengthening entrepreneurial training in Brazilian technological higher education.

2. Theoretical Framework

2.1 Entrepreneurial education in higher education

Entrepreneurship is a multidimensional phenomenon related to business creation, innovation, job creation, and economic and social development. However, its contemporary understanding is not limited to the creation of new ventures, since entrepreneurial behaviors can also manifest themselves within organizations, through intrapreneurship, and in initiatives aimed at generating social and environmental value (Foucrier & Wiek, 2019; Bogatyreva, Laskovaia, & Osiyevskyy, 2022; Geradts & Alt, 2022). This broader understanding of the

phenomenon already constitutes one of the conceptual bases of the study that preceded this investigation.

Economic, technological, and social transformations have also been modifying the skills required of professionals, increasing the need to train individuals capable of dealing with dynamic environments, identifying opportunities, developing solutions, and responding creatively to new challenges. In this context, higher education institutions assume a relevant role in disseminating entrepreneurship and training students with knowledge, skills, and dispositions related to entrepreneurial activity (Zhang et al., 2020; Longva et al., 2020).

Historically, a significant portion of higher education institutions has focused on preparing students for entry into the job market. However, entrepreneurial education has begun to occupy an increasingly prominent space in academic activities, expanding professional training and seeking to stimulate entrepreneurial attitudes, skills, and intentions among students (Laviere, 2010; Chien-Chi et al., 2020). This movement can also be observed in the growth of scientific production dedicated to entrepreneurial education and the factors associated with the formation of entrepreneurial intentions (Fellnhöfer, 2018; Fernández-Pérez et al., 2019; Liu et al., 2019).

Entrepreneurial education can therefore be understood more broadly than simply teaching content related to developing business plans or creating and managing companies. Its purpose also involves developing skills, behaviors, and ways of thinking that enable students to identify opportunities, solve problems, make decisions, and act proactively in different professional contexts.

Despite the progress in this field, challenges remain regarding how entrepreneurship should be incorporated into higher education. Kuratko (2005) already identified trends and challenges related to the consolidation of entrepreneurial education, while Lima et al. (2015), considering specifically the Brazilian reality, pointed out opportunities for its improvement. Schaefer and Minello (2016), in turn, draw attention to the premises, objectives, and methodologies involved in entrepreneurial education.

Recent studies reinforce the need to deepen this discussion. Melchor -Duran et al. (2025), based on a thematic literature review, identified distinct results regarding the effects of entrepreneurial education on the entrepreneurial intention of university students. The authors found studies that demonstrate positive direct effects, absence of effect, and indirect relationships or those conditioned by mediating and moderating variables. These results show that simple exposure to entrepreneurial education does not necessarily produce the same effects in all contexts, reinforcing the need to understand how this training is structured and experienced by students.

Thus, more than investigating the existence of disciplines or activities related to entrepreneurship, it becomes relevant to understand how institutions structure environments and experiences capable of promoting entrepreneurial training. This perspective shifts the discussion from isolated content to the set of pedagogical and institutional practices that make up the learning process.

2.2 Experiential learning and student protagonism

One of the central challenges of entrepreneurial education is related to the methodologies used to develop skills that can hardly be built solely through the transmission of content . Entrepreneurship involves acting under conditions of uncertainty, identifying problems and opportunities, developing solutions, interacting with different stakeholders, and making decisions. For this reason, experience-based approaches are particularly relevant in this field.

Araújo and Davel (2018), a reference already present in the original study, link entrepreneurial education and experience based on the contributions of John Dewey. From this perspective, learning does not only result from the acquisition of knowledge, but also from the interaction between action, experience, and reflection.

In the context of entrepreneurial education, this concept can be materialized through projects, solving real-world problems, developing products and services, interacting with companies and entrepreneurs, simulations, competitions, hackathons , and other activities that bring students closer to situations similar to those found in organizational and entrepreneurial environments.

Contemporary studies reinforce the relevance of this approach. Recent literature on experiential entrepreneurial education highlights that practices grounded in experience can broaden student engagement and bring the educational process closer to situations actually experienced during the entrepreneurial process. Experiential learning is also being discussed as one of the ways to expand the reach of entrepreneurial education beyond conventional teaching methodologies.

In this sense, the notion of "learning by doing" becomes relevant to entrepreneurial training. Instead of remaining a passive recipient of information, the student actively participates in identifying problems, building alternatives, experimenting with solutions, and evaluating results. Mistakes, revising decisions, and adapting become elements of the learning process itself.

Experiential learning is therefore directly related to student protagonism. The use of real-world projects and challenges demands autonomy, initiative, collaboration, responsibility, and decision-making on the part of the students. Protagonism does not mean the absence of teacher guidance, but rather a change in the traditional learning dynamic, in which the student assumes a more active role in the construction of knowledge.

This perspective also broadens the scope of entrepreneurial education. The training doesn't necessarily have to result in the immediate creation of a company, but it can contribute to developing entrepreneurial skills applicable to different career paths, including working in existing organizations, social projects, innovation, and creating new businesses.

2.3 Curriculum integration, interdisciplinarity and teaching performance

The effectiveness of entrepreneurial education also depends on how it relates to the curriculum and other formative experiences of students. When entrepreneurship remains restricted to a specific subject and disconnected from other areas of education, there is a risk of it being perceived as supplementary content, rather than a transversal competence.

Integrating entrepreneurship into curricular components, integrative projects, and problem-solving scenarios makes it possible to mobilize knowledge from different areas to build solutions. Interdisciplinarity becomes particularly relevant in this process, since business, technological, and social problems are rarely confined to the limits of a single area of knowledge.

The original study already highlighted that entrepreneurial education can contribute to the development of new learning strategies for the curriculum itself. In this way, entrepreneurship can be understood simultaneously as an object of learning and as a possibility for integrating knowledge and experiences.

This discussion finds support in Vedana and Andreassi (2025), who, based on a literature review, propose a more integrated understanding of entrepreneurship education. The authors identify the following as relevant issues for the field: the evaluation of teaching and learning methods and practices, teacher training, classroom and experiential learning, support for entrepreneurship, and the relationship with the entrepreneurial ecosystem.

In this process, the teacher assumes a fundamental role. The adoption of experiential and project-based methodologies modifies the traditional relationship between teacher, student, and knowledge. The teacher ceases to act exclusively as a transmitter of content and also begins to perform the functions of facilitator, guide, and mediator of learning.

This role demands specific teaching skills. Proposing challenges, guiding teams, stimulating reflection, connecting students with external stakeholders, and leading learning processes based on experimentation requires institutional and pedagogical preparation. Consequently, teacher training is an important component of an institutional strategy for entrepreneurial education.

Curriculum integration, interdisciplinarity, and teaching practice are, therefore, complementary elements. When articulated, they allow entrepreneurial education to cease being an isolated initiative and become integrated into different moments and spaces of academic training.

2.4 Entrepreneurial University and its articulation with the entrepreneurial ecosystem

Entrepreneurial education does not occur exclusively within the classroom. Higher education institutions are embedded in environments comprised of companies, public organizations, incubators, accelerators, investors, entrepreneurs, scientific institutions, and various social actors. Interaction with these agents can broaden learning opportunities and bring students closer to real-world contexts of innovation and entrepreneurship.

This perspective relates to the concept of the **entrepreneurial university** , according to which higher education institutions can assume a broader role in the generation, circulation, and application of knowledge. Teaching and research coexist with activities of innovation, knowledge transfer, interaction with organizations, and contribution to economic and social development.

Abreu and Grinevich (2024) highlight the complexity of the entrepreneurial university as an organization characterized by multiple missions, different processes, and objectives that may coexist or compete with each other. This understanding moves away from a simplistic view that becoming an entrepreneurial university would only mean stimulating the creation of companies or *spin-offs* . The institutional configuration involves strategies and processes related to the different functions performed by the university.

In the context of entrepreneurial education, this perspective implies understanding incubators, accelerators, labs, companies, startups, competitions, events, and mentor networks not only as complementary structures, but as potential **learning spaces** . When linked to academic activities, these environments allow students to engage with real-world problems, technologies, entrepreneurs, and opportunities.

Vedana and Andreassi (2025) further this understanding by advocating a holistic and integrated view of entrepreneurship education, including support for entrepreneurship, the entrepreneurial process, and the ecosystem. The authors argue that teaching, practice, and research in entrepreneurial education should be examined in connection with contextualized support systems articulated within the university and the entrepreneurial ecosystem.

This approach is particularly important for higher technological education, where the connection between knowledge, technology, organizations, and practical application is a key characteristic of the educational process. Interaction with the ecosystem can provide students with opportunities to test their knowledge, participate in projects, develop solutions, and understand how real-world innovation environments work.

Thus, strengthening entrepreneurial education does not depend exclusively on the presence of specific subjects, but on the existence of institutional conditions capable of connecting curriculum, learning experiences, and the entrepreneurial ecosystem.

2.5 Internationalization and networking in entrepreneurial education

Internationalization constitutes another dimension capable of expanding the possibilities of entrepreneurial education. Interaction between institutions from different countries makes it possible to share knowledge, methodologies, and educational practices, and allows teachers, researchers, and students to come into contact with different economic, institutional, and cultural contexts.

The study that preceded this investigation already highlighted the relevance of information exchange and collaboration between educational institutions from different countries as a strategy for enriching entrepreneurial education. The articulation of experiences from distinct contexts allows access to different perspectives, methods, and business environments.

International collaboration can also foster innovation, creativity, and critical thinking, skills that are relevant for working in increasingly dynamic and interconnected environments (Redford, 2024).

However, identifying international practices does not mean that models developed in a particular country can be automatically reproduced in another context. Cultural, economic, and institutional aspects influence entrepreneurial behavior and the conditions under which entrepreneurship develops (Tan, 2002; George & Zahra , 2002).

Comparative studies between countries contribute precisely to understanding these differences. Busenitz and Lau (1996), for example, sought to explain cultural

differences related to the propensity for entrepreneurial activity. In this sense, international experiences should be interpreted considering the particularities of each educational system.

Internationalization can therefore be understood as a mechanism for **institutional learning and network building**. Contact with experiences developed in other countries allows for the identification of principles, methodologies, and practices that can be critically analyzed and, when relevant, adapted to the characteristics of the host institution.

In Brazilian higher technological education, this perspective broadens the understanding of internationalization beyond academic mobility, incorporating collaboration between teachers and researchers, the development of joint projects, the sharing of pedagogical practices, and the construction of international networks for teaching, research, innovation, and entrepreneurship.

Thus, the literature analyzed allows us to understand entrepreneurial education as a phenomenon that goes beyond the offering of specific subjects and involves different components of the educational environment. Its effectiveness is related not only to the content taught, but also to the methodologies used, the experiences provided to students, the performance of teachers, curricular integration, institutional structures, and the relationships established with external actors.

This understanding finds support in the contemporary perspective presented by Vedana and Andreassi (2025), according to which entrepreneurship education, entrepreneurial universities, the entrepreneurial process, and the ecosystem should be analyzed in an integrated manner. Similarly, the complexity of the different functions assumed by contemporary universities reinforces the need to understand entrepreneurial education as part of a broader institutional context (Abreu & Grinevich, 2024).

Based on this foundation, the present study considers six interconnected dimensions for the analysis of the observed practices: **(1) experiential learning; (2) curricular integration and interdisciplinarity; (3) student protagonism; (4) teacher performance in entrepreneurial training; (5) articulation with the entrepreneurial ecosystem; and (6) internationalization and network building**.

These dimensions are not understood as independent components, but as potentially complementary elements of an **integrated system of entrepreneurial education**. From this perspective, entrepreneurial training is strengthened when the student actively participates in learning experiences, mobilizes knowledge from different areas, has teacher mediation, interacts with organizations and actors in the ecosystem, and has access to networks and experiences that go beyond institutional boundaries.

This understanding forms the conceptual basis for analyzing the experiences identified during the academic immersion in Portugal and for discussing their potential contributions to strengthening entrepreneurial education in Brazilian higher technological education.

3. Methodological Procedures

This study adopts a qualitative approach, exploratory and descriptive in nature, with elements of participatory research, aiming to understand entrepreneurial education practices observed in Portuguese higher education institutions and to analyze their possible contributions to the context of Brazilian technological higher education.

The qualitative approach was adopted because it allows for a deeper understanding of the practices, experiences, and institutional characteristics related to the promotion of entrepreneurship. Since the objective is to explore and interpret these experiences, and not to test hypotheses or establish causal relationships, this approach proves suitable for the exploratory nature of the research (Hair Jr. et al., 2006).

The research was developed from an academic immersion program in Portugal, which allowed the researchers to observe institutional activities, learn about educational and innovation environments, and interact with different actors linked to entrepreneurship. Direct participation in the activities and contact with the institutions formed the basis for the collection and subsequent systematization of information, characterizing the study as participatory research.

The field experience included activities in Portuguese higher education institutions, notably the University of Porto, the Polytechnic Institute of Viana do Castelo (IPVC), through the School of Business Sciences (ESCE), and the University of Lisbon, as well as organizations and environments related to entrepreneurship and innovation.

The activity plan included technical visits, contact with incubators and startups, meetings with faculty and managers, interaction with students, and observation of practices focused on entrepreneurial training. At the University of Porto, initiatives related to entrepreneurship were explored, with particular emphasis on the Master's Program in Innovation and Technological Entrepreneurship (MIETE). At ESCE-IPVC, the interaction involved practices promoting entrepreneurship, faculty activities, student experiences, and innovation spaces. The immersion also provided an opportunity to learn about entrepreneurship support programs in other Portuguese institutional environments.

The purpose of choosing these environments was to learn about different practices and methodologies in entrepreneurial education and to identify experiences that could serve as a reference for strengthening entrepreneurial training in Brazilian higher technological education.

Multiple sources of qualitative evidence produced during the academic immersion experience were used. Among them, the following stand out: participant observation, technical visits, dialogue interviews, meetings and interactions with institutional actors, and documents and materials related to the observed initiatives.

The observation took place during the monitoring of activities carried out in the visited institutions and allowed for the exploration of educational spaces, laboratories, innovation environments, projects, teaching methodologies, and institutional mechanisms supporting entrepreneurship. Direct contact with these contexts also made it possible to understand the participation of teachers, students, managers, and external agents in practices related to entrepreneurial training.

The dialogue-interviews, as termed in the experience report, were conducted in an open format with faculty, administrators, students, and other stakeholders involved in the observed initiatives. These interactions contributed to understanding institutional

practices and experiences related to entrepreneurship, serving as complementary sources of qualitative evidence.

Following the immersion phase, the information obtained through visits, observations, and dialogues was systematized into a technical report, which constitutes the main empirical basis of this study. For the elaboration of this article, these records were revisited and reorganized, seeking to identify recurring patterns in entrepreneurial education practices. The analysis, therefore, did not follow the chronological sequence of the activities carried out, but sought to understand the common elements and particularities found in the different contexts investigated.

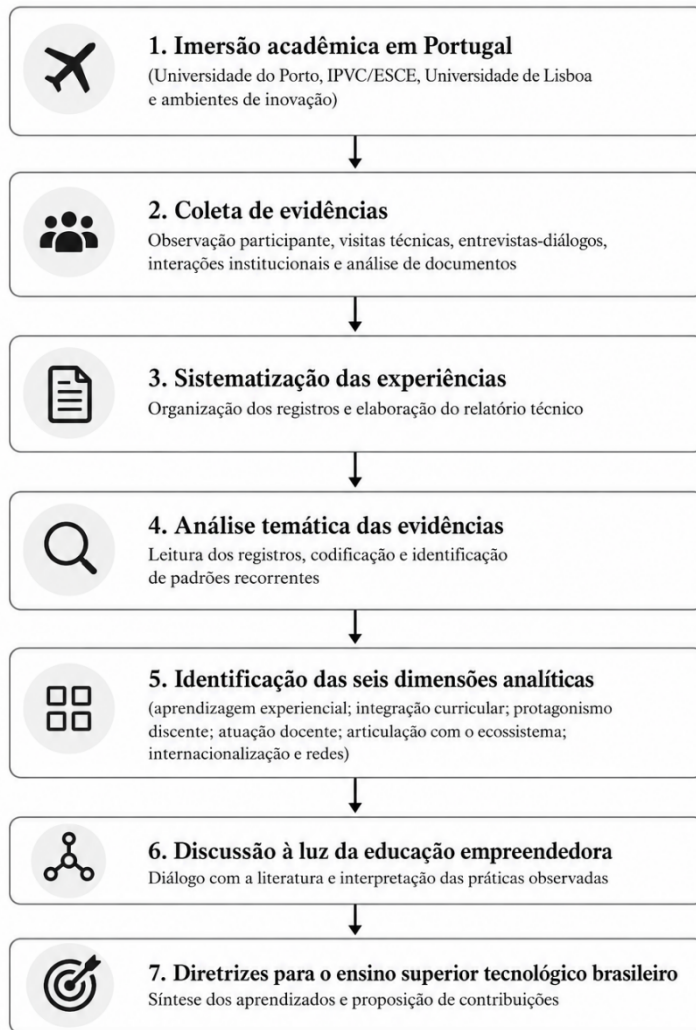
The analytical procedure involved reading the records, identifying evidence related to entrepreneurial education, grouping practices with similar characteristics, and subsequently organizing them into thematic categories of an interpretive nature. Therefore, the categories were not established prior to the immersion nor were they original categories of the 2023 report; they were constructed later, for the purposes of this investigation, based on a re-reading and systematization of the available evidence.

The analysis allowed us to organize the observed practices into six dimensions: (1) experiential learning; (2) curricular integration and interdisciplinarity; (3) student protagonism; (4) teacher role in entrepreneurial training; (5) articulation with the entrepreneurial ecosystem; and (6) internationalization and network building.

These dimensions were used as an analytical framework for the presentation and discussion of the results. The interpretation considered both the recurring patterns identified among the experiences and the particularities of each context, establishing a dialogue with the literature on entrepreneurial education.

This study does not intend to produce statistical generalizations about Portuguese or Brazilian institutions. Its purpose is to generate an analytical understanding of the observed practices, identifying principles and experiences that can support reflections and proposals for strengthening entrepreneurial education in Brazilian higher technological education.

Figura 1. Percurso metodológico da pesquisa.



Fonte: Elaborado pelas autoras (2024).

4. Results And Discussion

The analysis of experiences observed during the academic immersion in Portugal revealed that entrepreneurial education, in the contexts studied, is not limited to the provision of specific content on entrepreneurship. The practices identified point to a training built through a combination of practical experiences, integration of knowledge, active student participation, teaching performance, and closer ties between educational institutions and companies, startups, and other agents related to innovation. Although these elements were analytically organized into six dimensions mentioned above, their manifestation in the analyzed experiences

occurred in an interrelated manner, indicating that the boundaries between these dimensions are not always clearly defined.

Among the aspects that stood out most was the emphasis on learning through practice. In different activities observed, the student appears not only as a receiver of knowledge, but as an active participant in the process of constructing and applying that knowledge. This characteristic was particularly evident in the MARK'IT project, developed at the Polytechnic Institute of Viseu, in which students are challenged to develop a non-existent product or service, going through stages from its conception to its approach to the market. The initiative brings together approximately 400 participants, involves different curricular units, and includes the participation of representatives from the academic and business sectors in the evaluation of the work. Among the competencies considered are teamwork, leadership, creativity, and entrepreneurship, within a proposal explicitly oriented towards "knowing how to do" and "learning and doing".

The MARK'IT experience is particularly significant because it shows that entrepreneurship can play an integrative role in the educational process. More than learning concepts related to creating or managing businesses, students need to mobilize knowledge from different areas to transform an idea into a concrete proposal. This dynamic is similar to the concept of entrepreneurial education based on experience discussed by Araújo and Davel (2018), in which experience is not merely a complement to the educational process, but participates in the very construction of learning.

At the same time, the experience highlights the students' leading role. When students are faced with the challenge of developing an idea, solving a problem, or building a proposal that will be presented and evaluated, their position in the learning process changes. It becomes necessary to make decisions, negotiate alternatives, work collectively, deal with difficulties, and take responsibility for the results achieved. Entrepreneurship thus becomes something experienced, not just studied.

This shift in the student's role does not diminish the importance of the teacher. On the contrary, the experiences observed suggest a broadening of the teacher's role. The contacts made during the immersion with teachers, researchers, and those

responsible for different initiatives allowed us to perceive the importance of the teacher in creating and leading environments conducive to experimentation and student autonomy. The report records, among other aspects, the interaction with entrepreneurial teachers, researchers, and students, as well as contact with teaching methods, pedagogical tools, and possibilities for integrating entrepreneurship into the curriculum.

In this context, the teacher ceases to act exclusively as a transmitter of content and also begins to guide, accompany, stimulate reflection, and establish connections between academic knowledge and concrete situations. This observation reinforces the importance attributed to teacher performance and training in the literature on entrepreneurial education. Vedana and Andreassi (2025), for example, identify teacher training, teaching methods and practices, experiential learning, and relationships with the ecosystem among the relevant themes for the advancement of the field.

Another important set of evidence was found at the University of Porto, particularly in experiences related to the Master's program in Innovation and Technological Entrepreneurship (MIETE). The observed approach articulates scientific and technological knowledge with the identification of opportunities and the development of new businesses. Contact with this experience allowed for the identification of a training program in which entrepreneurship, technology, and innovation appear interconnected. The report also records companies launched by participants and graduates and their engagement with incubation processes, highlighting concrete possibilities for transforming academic and technological knowledge into entrepreneurial initiatives.

The records related to MIETE students and graduates also include elements that go beyond technical expertise. Among the experiences reported are references to understanding customer needs, developing new ways of thinking about problems, and applying acquired knowledge in practice. These elements reinforce a broader understanding of entrepreneurial training, which is not limited to the immediate intention of creating a company, but involves developing the ability to recognize needs, interpret situations, and transform knowledge into potential solutions.

The connection between academic training and the entrepreneurial environment became even more evident during contact with incubators, innovation spaces, and startups. A particularly illustrative case recorded during the experience was that of PLANTZ, a startup founded by former Brazilian and Portuguese students connected through their training at the University of Porto. This case demonstrates a trajectory in which academic training, international experience, skills development, and business creation appear interconnected.

Rather than interpreting the creation of a startup as an isolated result, this experience draws attention to the environment surrounding its formation. Contact with entrepreneurs, companies, incubators, and other agents can broaden learning possibilities and allow students to visualize professional paths and opportunities that would hardly be experienced solely within the classroom. From this perspective, the entrepreneurial ecosystem can also be understood as a learning space, especially when there is a connection between its structures and academic activities.

This interpretation converges with Vedana and Andreassi (2025), who advocate an integrated understanding of entrepreneurship education, support mechanisms, the entrepreneurial process, and the ecosystem. It also aligns with the discussion of Abreu and Grinevich (2024), who treat the entrepreneurial university as an organization in which different missions, processes, and objectives coexist, going beyond an understanding of university entrepreneurship limited exclusively to the creation of companies.

The experiences analyzed also showed that entrepreneurial practices can acquire greater meaning when they permeate different academic activities. Integrative projects, interdisciplinary activities, and engagement with real-world problems allow entrepreneurship to cease being treated as a subject belonging exclusively to one discipline. This finding is especially relevant when considering higher technological education, in which the articulation between theoretical knowledge, technological application, and the needs of the professional environment constitutes an important characteristic of the training.

In this sense, curricular integration and interdisciplinarity appear related to the very nature of the observed experiences. A project that requires developing a product or

service, for example, rarely mobilizes knowledge from a single area. Aspects related to technology, market, people, communication, finance, and management may be necessary to transform an idea into a viable solution. Entrepreneurial education, therefore, also functions as a possibility for articulating knowledge that, in the formal curriculum, may be distributed across different components.

Internationalization was another relevant element of the experience analyzed. Its significance, however, proved broader than simply academic mobility between countries. The immersion facilitated closer ties between Brazilian and Portuguese researchers, the sharing of methodologies and practices, and interaction with professors, students, managers, entrepreneurs, and innovation environments. The study preceding this investigation already highlighted that collaboration between institutions from different countries can broaden access to distinct perspectives, methods, and contexts of entrepreneurship, fostering innovation, creativity, and critical thinking.

From this perspective, internationalization can be interpreted as an opportunity for institutional learning and network building. The value of the Portuguese experience does not lie in the possibility of transferring ready-made practices to Brazil, but in learning about other ways of organizing entrepreneurial education, comparing them with the Brazilian reality, and identifying principles that can be reinterpreted in light of the characteristics of technological higher education. This precaution is necessary because cultural and institutional aspects influence entrepreneurship and need to be considered in analyses conducted between different countries (Tan, 2002; George & Zahra, 2002; Busenitz & Lau, 1996).

When experiences are considered together, however, a result emerges that goes beyond the individual identification of practices. The entrepreneurial training observed seems to acquire greater consistency when different initiatives find points of connection. Projects, curricular activities, student participation, teacher performance, interaction with companies, incubators and innovation environments, and international experiences do not need to function as independent actions; on the contrary, they can constitute complementary parts of the student's formative trajectory.

This finding suggests that strengthening entrepreneurial education may be less related to the quantity of initiatives offered by an institution and more to its ability to establish connections between them. The existence of an entrepreneurship course, for example, represents a formative opportunity, but its reach can be broadened when the knowledge developed finds continuity in projects, real-world challenges, interdisciplinary activities, or interactions with companies and innovation environments. Similarly, an incubator, a competition, a mentorship program, or an international experience can acquire greater educational significance when it relates to the student's academic path, rather than being a one-off, disconnected experience.

Based on this interpretation, the six dimensions identified in this study can be understood not only as categories used to organize the evidence, but as interdependent dimensions of entrepreneurial education. No hierarchical relationship or mandatory sequence is established between them. Experiential learning fosters active student participation; curricular integration allows for the mobilization of knowledge from different areas; student protagonism expands autonomy and responsibility; teacher involvement provides guidance and mediation; articulation with the ecosystem brings training closer to real situations and actors; and internationalization broadens references, experiences, and collaborative networks. The central aspect, therefore, lies in the possibilities of connection between these dimensions.

Based on the evidence analyzed, an integrated perspective of entrepreneurial education in higher technological education is proposed, grounded in the articulation of these six dimensions. This proposition should be understood as an interpretative synthesis of the results, and not as a validated theoretical model. Its contribution lies in highlighting that curriculum, experiences, students, teachers, institution, and external environment can produce greater formative value when understood as related components of the same educational process.

This perspective has a relevant implication for Brazilian higher technological education. Strengthening entrepreneurial education does not necessarily mean continuously creating new actions, but it can mean connecting existing ones in a

more consistent way. Disciplines, integrative projects, extension activities, business challenges, hackathons, technical visits, mentoring, incubators, and international experiences can expand their formative potential when they cease to represent isolated opportunities and begin to establish continuity throughout the student's academic trajectory.

Thus, the main lesson learned from the experiences analyzed can be summarized as a shift from a logic of offering initiatives to a logic of integrating entrepreneurial experiences. More than asking how many entrepreneurial actions an institution offers, the results of this study suggest the importance of understanding how these actions relate to each other, how they reach students, and how they connect to the curriculum, professors, the institutional environment, and the external ecosystem. This logic of integration constitutes a possibility for reflection on Brazilian technological higher education and opens space for future studies to empirically investigate how different forms and levels of articulation between these dimensions can contribute to the development of entrepreneurial training.

5. Final Considerations

This study aimed to analyze entrepreneurial education practices identified in Portuguese higher education institutions, seeking to understand how these experiences can contribute to strengthening entrepreneurial training in Brazilian technological higher education. Through the reinterpretation and systematization of evidence produced during the academic immersion in Portugal, it was possible to identify elements that broaden the understanding of entrepreneurial education beyond the offering of specific subjects or activities related to business creation.

In response to the research question, the results indicate that the observed practices can contribute to the Brazilian context mainly by highlighting the importance of an education that articulates experiential learning, curricular integration and interdisciplinarity, student protagonism, teacher performance, connection with the entrepreneurial ecosystem and internationalization, and network building. More than the individual presence of these dimensions, the analysis showed the relevance of the connections established between them throughout the student's educational journey.

The experiences analyzed also highlighted different possibilities for materializing this perspective. Initiatives such as MARK'IT demonstrated how practical projects can bring together different curricular components and place the student in an active position in the creation and development of solutions. The experiences related to MIETE, in turn, highlighted possibilities for articulation between scientific and technological knowledge, innovation, identification of opportunities, and development of new businesses. Contact with professors, students, startups, incubators, and other innovation environments further reinforced the importance of the relationships established between the educational institution and the different actors that make up its external environment.

The main contribution of this study, therefore, lies in identifying a logic for integrating entrepreneurial experiences. The results suggest that strengthening entrepreneurial education does not necessarily depend on the continuous expansion of the number of initiatives offered by institutions, but on the ability to connect them and give them continuity and meaning in the academic journey of students. This interpretation allows us to shift the focus from a logic predominantly based on the offering of actions to a perspective in which it is important to understand how curriculum, experiences, students, teachers, institution, and external environment relate to each other in the construction of entrepreneurial training.

This finding has significant implications for Brazilian higher technological education. Entrepreneurship courses, integrative projects, extension activities, business challenges, technical visits, hackathons, mentoring, incubators, interaction with companies, and international experiences can constitute important learning opportunities. However, their formative potential can be expanded when these initiatives cease to occur in a fragmented way and begin to establish relationships with each other and with the curriculum. In this sense, strengthening entrepreneurial education can mean not only creating new activities, but also recognizing, organizing, and connecting practices that are already part of the institutional routine.

International experience has also shown that learning about practices developed in other countries does not mean automatically reproducing them. Institutional, cultural, economic, and educational contexts need to be considered when analyzing their

applicability. Thus, Portuguese experiences should be understood as references capable of provoking reflection and institutional learning, and not as ready-made models for transfer to the Brazilian context. The very literature used as the basis for this study recognizes the influence of cultural and institutional differences on entrepreneurship.

The study has limitations that should be considered. The evidence derives from an academic immersion involving participant observation, technical visits, dialogue interviews, institutional interactions, and document analysis. As the experience was not designed to represent all Portuguese higher education institutions, the results are not generalizable to this context. Furthermore, the six analytical dimensions were constructed *a posteriori*, based on the systematization of available records.

Future studies could examine these dimensions in different institutions and contexts, incorporating the perspectives of students, teachers, managers, and actors in the entrepreneurial ecosystem. It is also recommended to investigate their relationship with competencies, self-efficacy, intention, and entrepreneurial behavior. Longitudinal studies could analyze how exposure to different entrepreneurial education experiences relates to changes in students' attitudes and behaviors throughout their training.

Finally, the results allow us to understand entrepreneurial education as a process that transcends the limits of a single discipline and is built upon the relationships between different experiences and actors. From this perspective, training for entrepreneurship means creating conditions for students to transform knowledge into action, recognize opportunities, confront problems, develop solutions, and actively participate in their own educational journey. For Brazilian higher technological education, the challenge may not only be to do more, but to better connect what is already being done, transforming dispersed initiatives into experiences capable of producing a more integrated, meaningful, and coherent entrepreneurial training trajectory.

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