Academic Entrepreneurship: Challenges and Opportunities of the Poliempreende Program

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Abstract: This study examines the effect of the Poliempreende program on the development of transversal and entrepreneurial skills among students at the Polytechnic University of Cávado and Ave, as well as its role in enhancing employability and fostering professional networking opportunities. The research stems from the need to assess Poliempreende's contribution to strengthening the entrepreneurial culture, bridging the gap between academia and industry. The main objectives are: i) to analyze the impact of Poliempreende on the development of transversal and entrepreneurial skills, ii) to explore the dynamics between academia and industry, and iii) to evaluate the challenges and opportunities of this program within the IPCA context. To accomplish these goals, a survey has been created and answered by the finalists of the last four editions of Poliempreende. The results provide evidence on the impact that Poliempreende had on the development of skills such as leadership, resilience, communication, and innovation capacity. It also backed up the participants' employability, and it has also facilitated access to professional networking opportunities. Furthermore, the program's structured framework, which combines workshops, mentoring, and competitions, has proven to be valuable in preparing participants for real-world challenges. Although, despite its positive impact, the program would have benefited from a more structured post-competition support, which could have been provided by an incubator, to consolidate the project outcomes and ensure business continuity. The findings underscore the potential for higher education institutions to drive regional development and economic growth through initiatives like Poliempreende.

Keywords: Poliempreende, Entrepreneurial skills, Transversal skills, HEIS Third Mission, Higher Education.

1. Introduction

Entrepreneurship has become an area of growing relevance in the academic context, standing out for its potential to increase innovation and economic development. Audretsch and Thurik (1999) point out that entrepreneurship is a driving force behind the creation of new opportunities and jobs, representing an effective response to changes in the global market. In this sense, this paper focuses on the study of academic entrepreneurship, with special emphasis on the Poliempreende program, developed at the Polytechnic University of Cávado and Ave (IPCA).

The choice of this issue arises from the need to better understand the role of higher education institutions in transferring knowledge and promoting entrepreneurial skills among students and the academic community. The Poliempreende program, as an entrepreneurship support platform, has proven to be a fundamental asset for bringing closer academia and industrial organizations, encouraging and giving rise to the creation of new innovative companies (Lopes *et al*., 2021).

The main general objectives of this study are i) to analyze the impact of Poliempreende on the development of transversal and entrepreneurial skills, ii) to investigate the dynamics between academia and industry, and iii) to evaluate the challenges and opportunities of this program in the context of IPCA.

The methodology adopted is a quantitative, using a survey to inquire about the finalists of the last 4 editions of Poliempreende held at IPCA, i.e., participants who have completed the entrepreneurial process and presented the final pitch. The data was analyzed using descriptive statistics.

The paper is organized into two parts. The first part presents the literature review on academic entrepreneurship, the role of Higher Education Institutions, and the Industry/Academia relationship. The second part presents the methodology and the case study, namely, the analysis of the survey and the respective discussion of results; finally, the conclusions are presented.

2. Academic Entrepreneurship

Academic entrepreneurship plays a central role in the application of knowledge and technology, facilitating the transfer of innovations from research institutions to the market. It includes the transformation of scientific discoveries into economic and social value through formal mechanisms such as spin-offs, patents, and licensing, as well as informal practices like consultancy and collaboration with industry (Balven et al., 2018).

Balven et al. (2018) describe academic entrepreneurship as the intersection between academia and the business sector, where knowledge is transformed into products, services, or companies that generate economic and social value. This view reinforces the importance of structured support mechanisms, such as incubators and partnerships, to bring laboratory innovations to market.

More recently, Giunti and Duberley (2023) emphasize that academic entrepreneurship is a core element of the "third mission" of higher education institutions, alongside teaching and research. They highlight that entrepreneurship activities should not only be market-driven but also aligned with the institution's responsibility to create social value. In this context, Sieg et al. (2023) argue that academic entrepreneurship must incorporate sustainability principles to ensure long-term impact. Innovations should not merely respond to market opportunities but also promote eco-innovation and contribute to sustainable development.

In parallel, the role of entrepreneurial education has gained prominence as a catalyst for academic entrepreneurship. Entrepreneurial education contributes to the development of essential competencies such as decision-making, risk management, and self-confidence, while also preparing students for the practical challenges of creating new ventures (Ramos et al., 2020). Initiatives that combine theory with practice, such as startup internships, mentoring, and incubation, offer students a more realistic understanding of the entrepreneurial process, enhancing their capacity to translate knowledge into viable business models (Ramos et al., 2020; Lopes et al., 2021). Furthermore, the development of soft skills, such as creativity, leadership, and teamwork, is increasingly recognized as fundamental for fostering innovative environments in which students can transform ideas into value-generating enterprises (Lopes et al., 2021).

According to Conceição and Rodrigues (2021), academic spin-offs are among the most tangible outcomes of academic entrepreneurship, as they represent a structured channel for transforming university-based research into marketable products or services. These ventures also reflect the growing role of higher education institutions as active contributors to regional economic and social development, going beyond their traditional missions of teaching and research.

Moreover, Conceição and Rodrigues (2021) highlight that motivations among academic entrepreneurs often diverge from purely profit-driven logic. Many founders prioritize knowledge dissemination, societal contribution, or long-term project sustainability over immediate commercial success. They also emphasize that the entrepreneurial process within academia is shaped by a set of critical stages, including opportunity recognition, commitment, credibility building, and pursuit of sustainability, each of which presents its own set of challenges.

Importantly, they argue that adverse economic conditions, such as financial crises, do not necessarily inhibit academic entrepreneurship. On the contrary, necessity-driven entrepreneurship can emerge as an alternative for researchers and graduates facing limited labour market opportunities, suggesting that spin-off creation may even increase during downturns.

Finally, the authors underline that several institutional and contextual factors condition the success of academic spin-offs, such as access to infrastructure, support from the parent university, and collaboration with external partners. Therefore, the presence of a supportive ecosystem remains a crucial enabler for the effective implementation of academic entrepreneurship.

Despite the promising outlook, several authors highlight persistent barriers. Testas and Moreira (2014) point to the limited diffusion of entrepreneurial practices across academic disciplines, particularly outside business schools, underscoring the need for systemic reforms that embed entrepreneurship education more broadly in higher education curricula. Similarly, Lopes et al. (2021) identify bureaucratic constraints and a lack of practical experience among students as challenges that hinder the full implementation of academic entrepreneurship. These critical perspectives suggest that while academic entrepreneurship holds significant transformative potential, its success depends on coherent institutional strategies, cross-disciplinary integration, and supportive ecosystems.

3. Higher Education Institutions and the Third Mission

Since the early 19th century, with the emergence of the Humboldtian model that integrated research and teaching, Higher Education Institutions (HEIs) have undergone multiple transformations (Schnurbus & Edvardsson, 2020). A third institutional mission, focused on societal engagement and regional development, has been gaining increasing prominence alongside the traditional missions of teaching and research (Chatterton & Goddard, 2000).

Chatterton and Goddard (2000) were among the first to frame this "third mission" as the incorporation of entrepreneurial activities aimed at generating not only economic value but also public and social value through knowledge and technology transfer. This idea reflects a growing recognition of the societal responsibilities of HEIs.

The literature has since expanded to differentiate the nature of third mission activities. According to Donatiello and Gherardini (2019), these can be classified into profit-oriented and non-profit-oriented actions. The former includes formal and informal industry collaborations, academic consulting, patenting, and the commercialization of research through spin-offs. The latter involves public policy contributions, entrepreneurial education, and social outreach, such as lifelong learning and partnerships with vocational institutions (Cervantes, 2017).

Schnurbus and Edvardsson (2020) argue that HEIs have reached another inflection point, driven by globalization, financial market instability, and increasing competition for funding and talent. These external pressures have catalyzed a redefinition of institutional missions, leading to greater emphasis on internationalization and entrepreneurship. However, this evolution has not been seamless. While policies increasingly promote third mission activities, their institutionalization remains fragmented and uneven.

A critical perspective is offered by Calderón-Hernández et al. (2020), whose empirical research reveals tensions within academia regarding the role of knowledge. On one hand, some view it as a public good; on the other, others see it as proprietary and commodifiable. The authors highlight that rejecting the third mission, especially its emphasis on applied knowledge and societal impact, risks rendering HEIs isolated from the communities they serve. This detachment is exacerbated by the prevalence of academic outputs that are inaccessible to the general public, both in language and in utility.

Compagnucci and Spigarelli (2020) expand on this critique by emphasizing that the third mission should not be seen as an auxiliary function, but rather as a structural component of HEIs. They underline its potential to foster regional development through collaboration with non-academic stakeholders, such as governments, industries, and civil society. Yet, they also identify systemic constraints, including the tendency of institutions to imitate elite, research-intensive models, which can lead to detachment from local needs. Furthermore, the lack of incentives, resources, and recognition for third mission activities undermines their implementation. The multidisciplinarity and context-dependence of these activities only add to the complexity.

Finally, Muffatto et al. (2021) examine the entrepreneurial implications of the third mission. They argue that third mission activities enrich academic environments and ensure that research is aligned with real-world challenges. Their findings also suggest that HEIs that foster entrepreneurship through mechanisms such as incubators and mentoring programs stimulate both regional economic growth and researcher motivation. Importantly, the authors point out that institutional environments valuing practical knowledge application are more likely to see the emergence of academic entrepreneurs and the formation of innovative ventures. They advocate for policies that support intellectual property protection, spin-off creation, and long-term industry collaboration.

In summary, the literature on the third mission highlights both its transformative potential and its practical challenges. While the third mission is increasingly acknowledged as vital for aligning HEIs with societal needs, its integration into academic structures is still limited. The field would benefit from more critical, theory-driven research that addresses power dynamics, institutional inertia, and normative assumptions underpinning third mission discourse.

4. Methodology

To understand the role of higher education institutions in transferring knowledge and promoting entrepreneurial skills among students and the academic community, a case study of the Poliempreende program at the Polytechnic University of Cávado and Ave (IPCA) was carried out. The main general objectives of this study are i) to analyze the impact of Poliempreende on the development of transversal and entrepreneurial skills, ii)

to investigate the dynamics between academia and industry, and iii) to evaluate the challenges and opportunities of this program in the context of IPCA.

The methodology adopted a quantitative approach with data collected through an online survey (Google Forms) to be answered by participants of the last four editions of Poliempreende at IPCA. Considering the objectives of the study, only participants who reached the end of the entrepreneurial process were considered, i.e., participants who presented the final pitch to the Poliempreende jury, a total of 64 participants.

In terms of data collection, for the 2024 edition of Poliempreende, questionnaires were collected in person on the day of the final (10 July 2024), directly from participants presenting their projects. For previous editions (2021 to 2023), data were gathered between July and October of 2024, using a combination of methods: via the G3E platform, through email distribution, and direct personal contact with known participants from those editions. Of these 64 participants, 34 answered the survey, corresponding to a response rate of 53%.

In this study, the survey used consisted of four sections. The first section asks about sociodemographic data, followed by three sections, each associated with the three main objectives of the study, namely: section 1 - Transversal skills; section 2 - Entrepreneurial Skills; and section 3 - Perceived Employability.

5. Case Study: Poliempreende

Poliempreende is an annual entrepreneurship competition promoted by Polytechnic Higher Education Institutions to encourage the creation of innovative and sustainable businesses and promote an entrepreneurial mindset in academia. Aimed at students, graduates, and teachers, the program includes workshops, training sessions, and regional and national competitions, where business ideas are assessed according to criteria such as innovation, sustainability, and socio-economic impact. The best ideas receive prizes and support in their implementation (Poliempreende, 2024; Parreira *et al*., 2018).

Started in 2003 by the Castelo Branco Polytechnic University, it expanded nationally in 2007, with rotating coordination. Over the years, it has stood out for its technology transfer and regional development, creating 32 companies and registering 59 patents. With more than 1,800 participants, Poliempreende has had a relevant impact on the growth of entrepreneurship in Portugal (Parreira *et al*., 2011; Parreira *et al*., 2018).

Poliempreende plays a strategic role in strengthening the link between HEIs and the job market, creating an environment in which academic knowledge is put into practical use. As well as promoting the creation of companies, the program also contributes to regional development by supporting initiatives aligned with local and global needs (Parreira *et al*., 2011; Parreira *et al*., 2018).

Through workshops focused on entrepreneurial skills and a structured competition, participants have access to specialized training and personalized mentoring, thereby increasing their chances of successfully implementing their business ideas. This model not only promotes innovation but also consolidates the role of HEIs as agents of social and economic transformation (Poliempreende, 2024; Parreira *et al*., 2018).

Poliempreende goes beyond the confines of the academic world, bringing innovation and development to local communities. By encouraging the creation of companies and promoting technology transfer, the program contributes directly to the economic development of the regions where it takes place, being an example of how higher education can actively collaborate in socio-economic growth (Parreira *et al*., 2018).

The program also has an international dimension, with the cooperation of institutions such as the Macao Polytechnic Institute and organizations in Cape Verde, reflecting its commitment to preparing students for the global market (Parreira *et al*., 2018).

Poliempreende has faced challenges over the years, such as securing continuous funding and maintaining institutions' interest in the program. Despite these challenges, the program continues to grow and expand its influence (Parreira *et al*., 2018). In the future, the goals that are expected to be achieved include expanding the program to all Polytechnic Universities to ensure the participation of all institutions and increasing the reach of students from all polytechnic areas. In addition, it is intended to continue internationalization, in line with the best global practices in entrepreneurship and innovation. Finally, it is seen as necessary to create support structures in all institutions, guaranteeing formal resources for the development of entrepreneurial projects and strengthening support for entrepreneurship within the scope of the program (Poliempreende, 2024).

6. Results

This study analyzed four editions of the Poliempreende program, covering the years 2021 to 2024. In the four years analyzed, 64 people completed the entrepreneurial process, i.e., presented the final pitch for their project. Of these 64 people, 34 answered the survey, corresponding to a response rate of 53%. Analysis of this sample provides a better understanding of the results and effectiveness of Poliempreende in the context of the Polytechnic University of Cávado and Ave (IPCA).

6.1 Sociodemographic Data

Among the 34 respondents, there was a balanced gender distribution, with 53% female and 47% male. Concerning educational background, 53% of respondents have a bachelor's degree, 26% have secondary education, 14.71% have completed a master's degree, and 2.94% have a PhD. Educational diversity reflects that the program attracts participants with different levels of qualification. The educational diversity seen demonstrates the transversal interest in the program, ranging from young people who are still progressing in their studies to more qualified professionals looking for new skills.

In terms of employment status, the respondents are equally distributed between students (29.41%), employees (29.41%), and student-workers (29.41%). Only 11.76% are self-employed. This profile shows the flexibility of the program, which welcomes both participants at the start of their careers and those already in the job market. The balanced representation of the different job profiles reflects Poliempreende flexibility in attracting both those who are starting and those who already have experience in the market. This allows for a diverse environment rich in exchanges of experience.

Geographically, most participants come from Barcelos (32.35%) and Braga (29.41%), with less representation from other regions. This geographical concentration reflects the demographic profile of IPCA students. As for the schools of origin, the participation of the School of Technology (29.41%) and the School of Management (23.53%) stand out, showing greater interest in areas related to technology and business. The greater representation of these schools may indicate that the knowledge and skills worked on at Poliempreende have a direct and practical link with the more technical and market-oriented areas of study.

6.2 Experience as an Entrepreneur

Among the respondents, 53% have previous entrepreneurial experience, while 47% are just starting on their entrepreneurial journey. Similarly, 53% of the participants had experience in the business idea they developed in the program, while 47% had no such experience. These figures indicate that Poliempreende is relevant to both beginners and more experienced entrepreneurs. These figures reflect the versatility of Poliempreende, which manages to be a useful program for both those who already have entrepreneurial experience and those who are taking their first steps, providing a learning environment that is adaptable to different levels of experience.

6.3 Transversal Skills Acquired

The participants who responded perceived that they developed various transversal skills during the program. The most prominent were communication (70.59%), teamwork (67.65%), and problem-solving (64.71%), all of which are essential for success in entrepreneurial environments. These results show that the program not only focuses on technical skills, but also on interpersonal skills, which are essential in any professional context.

These skills have practical application, especially in professional and personal contexts (88.24%). Personal projects (61.76%) and academic activities (50%) were also identified as areas of application by the respondents. The wide applicability of the skills demonstrates that Poliempreende not only prepares participants for business creation scenarios, but also for a variety of practical situations in the job market and academic life.

The training received at Poliempreende is perceived as relevant to the job market, with almost all participants (91.18%) considering the skills acquired to be "very" or "quite" important, resulting in an average score of 4.35 on a Likert scale of 1 to 5. This data reinforces the program's ability to provide its participants with tools that are valued in the job market.

6.4 Developing Entrepreneurial Skills

Poliempreende contributes to the development of an entrepreneurial mindset. Networking stood out as the most developed skill (67.65%), followed by communication (61.76%), leadership (58.82%), and financial

knowledge (58.82%). These skills are often cited as fundamental pillars for building sustainable businesses and adapting to dynamic and collaborative working environments.

The competition encouraged 82.36% of respondents to look for business opportunities, with 82.35% planning to apply the entrepreneurial principles learned in their professional lives. These results show that the program stimulates innovation, creativity, and the ability to identify opportunities. In addition, the competition acted as a catalyst for innovation and creativity, helping participants to think "outside the box" and identify strategic solutions.

6.5 Impact on Employability

Most respondents (91.18%) believe that Poliempreende has improved or will improve their employability prospects, which reinforces Poliempreende positive impact on preparing participants for the labor market. This is especially relevant as it shows that the program not only develops skills but also increases participants' confidence in their abilities and future opportunities.

The entrepreneurial process was also considered "very" or "quite" effective in creating networking relationships and developing transversal skills, with respective averages of 4.24 and 4.32 on a Likert scale of 1 to 5. This recognition reflects Poliempreende ability to create value at both an individual and collective level, encouraging participants to create networks and collaborations that could be essential in the future.

Additionally, 88% of respondents expressed their intention to continue working on the business idea developed during the program, showing the lasting impact of Poliempreende on the motivation and ambition of its participants. This shows that the program not only promotes short-term learning but also has a long-lasting effect on the entrepreneurial attitude of its participants, encouraging them to continue developing their projects.

7. Discussion of Results

The analysis of the results obtained from the survey reveals important perceptions about the impact of Poliempreende on skills development, academic-industry collaboration, and the opportunities and challenges of the program in the context of the Polytechnic University of Cávado and Ave.

7.1 Development of Transversal Skills

One of the main objectives of the research was to assess how Poliempreende contributes to the development of transversal skills among the participants.

Leadership was one of the skills most mentioned by the participants (58.82%), who found themselves needing to organize teams, make strategic decisions, and motivate colleagues. The requirement to work as a team to achieve common goals provided a business simulation environment that enhanced these skills, creating a space conducive to practical experience, which, according to Spencer and Spencer (1993), is essential for the growth of effective leaders. This result reinforces the importance of behavioral and strategic skills for developing an entrepreneurial vision, according to Guerrero et al. (2021).

In addition, 24 of the 34 participants (70.59%) reported a significant increase in their communication skills. The practical experience of preparing and presenting pitches in front of juries made up of professionals was highlighted as a moment of personal transformation, where participants not only gained confidence but also learned how to structure and communicate their ideas persuasively. Clarity and effectiveness in conveying ideas, a critical aspect for success in any field, as emphasized by Spencer and Spencer (1993).

7.2 Developing Entrepreneurial Skills

The results of the questionnaires showed that Poliempreende was effective in developing entrepreneurial skills among the participants, a key dimension of the study. During the competition, 67.65% of respondents reported that they were able to improve their networking as one of the main skills developed. This process involved not only creating new connections but also teaching participants the importance of maintaining professional relationships, something that can have a direct impact on their future entrepreneurial activities.

In addition, 61.76% pointed to improvements in their communication skills, while 58.82% highlighted the development of leadership and financial knowledge. Financial knowledge was described as one of the pillars

that enabled participants to better understand the economic viability of their business ideas, contributing to a more strategic vision of business planning and execution.

These results show that participation in Poliempreende encourages not only the creation of innovative ideas but also the formation of a solid base of skills for the business environment, as described by (Pallavi et al., 2022).

7.3 Employability and Networking

One of the main impacts of Poliempreende in the perception of the participants is the improvement of their employability prospects and the expansion of their professional networks, essential factors for a successful transition to the labor market. The majority of participants, around 93.9%, reported that the Poliempreende experience increased their attractiveness on the labor market. This figure is particularly relevant, as it indicates that the program not only develops specific skills but also reinforces the perception of participants as more complete professionals prepared for modern challenges.

The program demonstrates that they are proactive individuals capable of innovation. This perception is in line with the study by Pallavi *et al*. (2022), which highlights the role of entrepreneurship in creating social and economic value by training individuals for the job market. In addition, Poliempreende helped to consolidate skills that go beyond technical knowledge, such as the ability to adapt and resilience, characteristics that are often valued by employers in highly competitive scenarios.

Participation in Poliempreende gave 91.2% of the participants access to a diverse network of professionals, mentors, and potential investors, which they recognized as one of the main benefits of the program. According to Guerrero *et al*. (2021), networks have a lasting impact on an entrepreneur's career, as they provide access to knowledge, resources and opportunities. In the context of Poliempreende, these networks not only opened doors to future partnerships and investments but also allowed participants to get valuable feedback on their projects, increasing their chances of success.

8. Conclusions

The main objective of this research was to analyze the impact of the Poliempreende program on the development of transversal and entrepreneurial skills among students at the Polytechnic University of Cávado and Ave (IPCA), as well as its role in promoting employability and creating professional networks. Specifically, we sought to understand the program's contribution to promoting an entrepreneurial culture in the academic context, while assessing the challenges and opportunities associated with the program in regional and academic development.

To meet these objectives, a case study was carried out on Poliempreende at IPCA, using a quantitative methodological approach. A survey was answered by finalists of the last four editions of the program (2021, 2022, 2023, and 2024).

The conclusions of this study on the impact of Poliempreende at IPCA confirm the importance of the program as an essential tool for developing skills and promoting academic entrepreneurship. The program has fulfilled its role in instilling an entrepreneurial culture, offering students an environment where they can acquire and apply practical knowledge and develop critical skills for the labor market.

In terms of contributions to skills development, the results confirm that Poliempreende contributes to the development of transversal and entrepreneurial skills, such as leadership, critical thinking, and resilience, in line with the literature on the importance of these skills in the modern workplace (Carvalho, 2022; Pallavi *et al*., 2022). The program proved to be effective in empowering students with practical tools that strengthen their ability to adapt and innovate, essential characteristics for entering the labor market.

This study also highlights the need for higher education institutions to play an active role in the growth of academic entrepreneurship, recognizing them as strategic agents in the training of professionals prepared for the challenges of the labor market. This reinforces the importance of boosting programs such as Poliempreende, not only as a platform for developing skills, but also as a key element in promoting innovation, self-employment, and regional economic impact. Although some challenges and obstacles need to be overcome, such as the need for greater post-competition support and the implementation of an incubator, which has since been approved, the opportunities for strengthening the program are promising.

In short, the study highlights the importance of Poliempreende as a catalyst for the development of entrepreneurial skills in IPCA students, highlighting its role in promoting an entrepreneurial culture and creating a connection between academia and industry.

In this study, there were also constraints in obtaining responses to the survey - the response rate is close to 50%, largely because the participants from more distant editions in time, such as 2021 and 2022, are already disconnected from Poliempreende and there weren't as many responses as possible from these students. This study also did not carry out an advanced statistical study of the survey responses due to a lack of time and resources.

In terms of future expectations, this work has the possibility of being updated annually due to the fact that Poliempreende at IPCA takes place every year, so the data from the survey can be updated annually. With this update and a greater amount of data, policy implications can be drawn for HEIs and their Entrepreneurship support offices.

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Ethics Declaration

This study did not require ethical clearance for the research referred to in this paper.

AI Declaration

No AI tools were used in the development of this paper.

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