

**RESULTS OF AN INNOVATIVE ENTREPRENEURSHIP POLICY INSTRUMENT  
IN THE FEDERAL NETWORK OF PROFESSIONAL, SCIENTIFIC, AND  
TECHNOLOGICAL EDUCATION**

**RESULTADOS DE UM INSTRUMENTO DE POLÍTICA DE  
EMPREENDEDORISMO INOVADOR NA REDE FEDERAL DE EDUCAÇÃO  
PROFISSIONAL, CIENTÍFICA E TECNOLÓGICA**

**RESULTADOS DE UN INSTRUMENTO DE POLÍTICA DE EMPRENDIMIENTO  
INNOVADOR EN LA RED FEDERAL DE EDUCACIÓN PROFESIONAL,  
CIENTÍFICA Y TECNOLÓGICA**



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**ABSTRACT**

Considering the need to strengthen innovation and entrepreneurship within public education institutions, this research analyzes the outcomes of the Innovative Entrepreneurship (IE) project, an initiative of the Ministério da Educação (MEC) - Brazilian Ministry of Education aimed, at the Rede Federal de Educação Profissional, Científica e Tecnológica (RFEPCT) - Federal Network of Professional, Scientific, and Technological Education. The study aims to evaluate the project's impacts on the consolidation of entrepreneurial culture, research infrastructure, and institutional capacity for innovation generation and dissemination. To this end, a qualitative and quantitative methodological approach was adopted, based on the analysis of secondary data, surveys, and interviews with institutional actors involved in the project's implementation. Thus, the findings indicate that the IE project significantly contributed to improving research conditions, expanding access to applied knowledge, and strengthening entrepreneurial practices within academic environments. However, challenges related to startup creation and innovation commercialization persist. This allows the conclusion that fostering innovative entrepreneurship in developing economies requires integrated public policies that align capacity building, technological innovation, and sustainable growth strategies to unlock long-term entrepreneurial potential.

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**Keywords:** Innovative Entrepreneurship. Startups. Economy 4.0. Public Policy. Innovation Policy.

## RESUMO

Considerando a necessidade de fortalecimento da inovação e do empreendedorismo no âmbito das instituições públicas de ensino, esta pesquisa analisa os resultados do projeto Empreendedorismo Inovador (EI), iniciativa do Ministério da Educação (MEC) voltada à Rede Federal de Educação Profissional, Científica e Tecnológica (RFEPCT). Objetiva-se avaliar os impactos do projeto na consolidação da cultura empreendedora, na infraestrutura de pesquisa e na capacidade institucional de geração e difusão de inovações. Para tanto, procede-se a uma abordagem metodológica de natureza qualitativa e quantitativa, baseada na análise de dados secundários, aplicação de questionários e realização de entrevistas com atores institucionais envolvidos na execução do projeto. Desse modo, observa-se que o EI contribuiu significativamente para a melhoria das condições de pesquisa, ampliação do acesso ao conhecimento aplicado e fortalecimento de práticas empreendedoras no ambiente acadêmico. Contudo, permanecem desafios relacionados à criação de startups e à comercialização das inovações desenvolvidas. O que permite concluir que a promoção do empreendedorismo inovador em economias em desenvolvimento demanda políticas públicas integradas, capazes de articular capacitação, inovação tecnológica e estratégias de crescimento sustentável, de modo a potencializar resultados de longo prazo.

**Palavras-chave:** Empreendedorismo Inovador. Startup. Economia 4.0. Políticas Públicas. Política de Inovação.

## RESUMEN

Considerando la necesidad de fortalecer la innovación y el emprendimiento en el ámbito de las instituciones públicas de educación, esta investigación analiza los resultados del proyecto Emprendimiento Innovador (EI), una iniciativa del Ministério da Educação (MEC) - Ministerio de Educación de Brasil orientada a la Rede Federal de Educação, Profissional, Científica e Tecnológica (RFEPCT) - Red Federal de Educación Profesional, Científica y Tecnológica. El estudio tiene como objetivo evaluar los impactos del proyecto en la consolidación de la cultura emprendedora, en la infraestructura de investigación y en la capacidad institucional para la generación y difusión de innovaciones. Para ello, se adopta una metodología de enfoque cualitativo y cuantitativo, basada en el análisis de datos secundarios, la aplicación de cuestionarios y la realización de entrevistas con actores institucionales involucrados en la ejecución del proyecto. De este modo, se observa que el EI contribuyó de manera significativa a la mejora de las condiciones de investigación, a la ampliación del acceso al conocimiento aplicado y al fortalecimiento de prácticas emprendedoras en el entorno académico. No obstante, persisten desafíos relacionados con la creación de startups y la comercialización de las innovaciones desarrolladas. Lo que permite concluir que la promoción del emprendimiento innovador en economías en desarrollo requiere políticas públicas integradas, capaces de articular la formación de capacidades, la innovación tecnológica y estrategias de crecimiento sostenible, con el fin de potenciar resultados a largo plazo.

**Palabras clave:** Emprendimiento Innovador. Startups. Economía 4.0. Políticas Públicas. Política de Innovación.

## 1 INTRODUCTION

Entrepreneurship is defined as the generation of value through the creation or expansion of economic activities through new products, processes, or markets (Rauch et al., 2009). Innovation is what distinguishes dynamic entrepreneurship from static entrepreneurship (Gianesini et al., 2018), and when combined with entrepreneurship, it forms the concept of 'Innovative Entrepreneurship' (EI), focused on new ventures and *startups* based on innovative ideas (Balkienė & Jagminas, 2014; Szabo & Herman, 2012).

In Brazil, despite high levels of entrepreneurship, many businesses are created out of necessity and are not innovative or high-growth (Ogliastri et al., 2019). The country has faced challenges in business innovation, with slow progress and weak indicators compared to other emerging economies (Koeller, 2017).

In 2020, the Ministry of Education (MEC) launched the first explicit government initiative of 'Innovative Entrepreneurship', directing resources to institutions in the Federal Network to develop applied research projects in the areas of Economy 4.0 (Industry, Agriculture and Services). 60 projects were selected in 31 institutions from all regions of Brazil, with the aim of creating startups and innovative solutions related to digital transformation (Rippa & Secundo, 2019). However, little is known about EI initiatives in developing economies.

This study seeks to evaluate the results of Brazilian support to EI, investigating whether the Project has stimulated the creation of favorable environments for innovation and business development based on technological solutions aligned with the demands of Economy 4.0. The research addresses documents related to the projects and includes interviews with the project coordinators. The central research question is: "To what extent has MEC's Innovative Entrepreneurship project promoted innovation and the creation of businesses aligned with Economy 4.0 in the institutions of the Federal Network?"

## 2 THEORETICAL FRAMEWORK

Innovation is widely recognized as a central element for the economic growth, competitiveness and sustainable development of nations. In contexts marked by globalization and the intensification of technological transformations, innovative processes are no longer linear and begin to require institutional coordination, strategic management, and articulation between different actors in the productive and scientific system. In this sense, the classic literature highlights innovation as a systemic phenomenon, dependent on the interaction between companies, universities, government and society (Kline et al., 1986; Freeman & Soete, 2008).

In Brazil, the construction of a policy focused on science, technology and innovation (ST&I) has its antecedents in the 1950s, with the creation of fundamental institutions such as the National Council for Scientific and Technological Development (CNPq) and the Coordination for the Improvement of Higher Education Personnel (CAPES). These institutional frameworks contributed to the consolidation of the national scientific base and to the training of qualified human resources. This evolutionary process culminated, in 1985, in the creation of the then Ministry of Science and Technology, later expanded to incorporate the innovation dimension, reflecting the recognition of the strategic role of ST&I in national development (Pelaez et al., 2017).

A significant advance occurred with the enactment of the Innovation Law (Law No. 10,973/2004), which established legal mechanisms to stimulate cooperation between universities, research institutes, and the productive sector. Among its main contributions, the institutionalization of the Technological Innovation Centers (NITs), responsible for the management of intellectual property and the promotion of technology transfer within scientific and technological institutions, stands out. The Innovation Law also boosted the creation of articulation bodies, such as the Forum of Innovation and Technology Transfer Managers (Fortec), and was complemented by the Good Law (Law No. 11,196/2005), which introduced tax incentives for business research and development.

In the following years, the country began to structure policies and programs specifically aimed at innovative entrepreneurship, with emphasis on initiatives such as Startup Brasil, InovAtiva Brasil and the expansion of incubators and accelerators linked to universities and public institutions. These actions sought to bring together entrepreneurs, investors and support agents, contributing to the formation of a more dynamic startup ecosystem (Carmo & Costa, 2016; Roncaratti, 2017; Aranha, 2016). Despite these advances, the literature points out that structural obstacles, such as excessive bureaucracy, regulatory complexity, and high tax burden, continue to limit the full development of entrepreneurial activities in the country.

More recently, the formulation of the National Innovation Policy (PNI), in 2020, and the National Strategy for Science, Technology, and Innovation (ENCTI 2016–2022) reinforced the Brazilian State's effort to integrate ST&I policies with market demands and the challenges of economic and social development. These instruments establish guidelines aimed at increasing productivity, reducing regional inequalities and strengthening the National Innovation System, evidencing the country's commitment to innovation as a structuring axis of development. However, the challenge remains to transform legal frameworks and institutional programs into effective and sustainable results, capable of positioning Brazil more competitively on the global stage (MCTIC, 2016; Vonortas & Castillo, 2022).

### 3 THE BRAZILIAN PROJECT OF INNOVATIVE ENTREPRENEURSHIP

The Innovative Entrepreneurship (EI) project was structured as a continuous public policy initiative, implemented through successive public calls, with the objective of fostering innovative entrepreneurship in the Federal Network of Professional, Scientific and Technological Education (RFEPCT). The action was conceived by the Secretariat of Professional and Technological Education of the Ministry of Education (Setec/MEC) and executed by the Federal Institute of Espírito Santo (Ifes), in partnership with the Foundation for Support to the Development of Science and Technology (Facto), assuming a national character since its first edition.

The first cycle of the project was launched in 2020, through Ifes Notice No. 05/2020, focusing on innovative entrepreneurship associated with Economy 4.0 technologies, covering the areas of Agriculture 4.0, Industry 4.0 and Services 4.0. This public notice provided for the execution of the projects for 24 months and resulted in the selection of 60 institutional projects, distributed among different Federal Institutes in the country, with criteria that integrated teaching, research and extension, in addition to technological impact, market potential and social impact.

Based on the accumulated experience, the project advanced to a second edition, which began in 2022, lasting 12 months and selecting 25 projects. However, the present study focuses exclusively on the analysis of the first cycle of the project, since it was fully completed at the time of data collection and analysis, allowing a more consistent evaluation of its results and institutional effects.

In general, the supported projects contributed to the promotion of the culture of innovation and entrepreneurship in the academic environment, to the development of applied technologies and to the formation of technical, managerial and entrepreneurial skills. Thus, the time frame between 2020 and 2023 shows the consolidation of Innovative Entrepreneurship as a relevant instrument of educational and innovation public policy, by articulating financing, training, and institutional governance, while establishing analytical bases for future evaluations of its subsequent editions.

#### 3.1 THE STRUCTURING OF THE PROJECT

The Innovative Entrepreneurship (IE) project aimed to support the selection and development of innovation and entrepreneurship projects within the scope of the Brazilian Federal Network of Professional, Scientific and Technological Education (RFEPCT). These projects were expected to contribute to the emergence of startups and innovative companies, especially in areas related to the digital technologies of the so-called Economy 4.0, such as

the Internet of Things, *Big Data* and Artificial Intelligence.

Instruments such as research grants, tax incentives, and specialized consultancies are widely used in innovation policies at the international level, and the IE project followed this approach by offering research grants and infrastructure resources to the 60 selected projects. Coordinated by the Secretariat of Professional and Technological Education of the Ministry of Education (Setec/MEC), the project had financial and administrative support for its implementation in the RFEPCT institutions.

Created in 2008, the Federal Network plays a strategic role in professional education and socioeconomic development in the country, being supported by institutional partners such as Sebrae and the Foundation for the Support of the Development of Science and Technology (Facto), which acted in the provision of financial support, training and administrative management, strengthening the innovation ecosystem linked to the participating institutions.

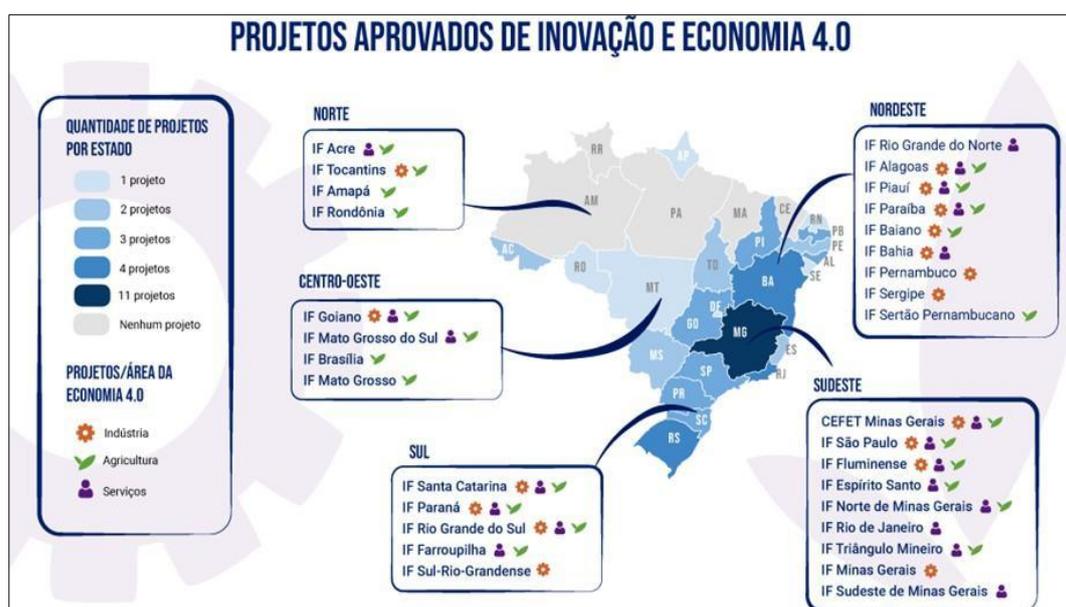
Also noteworthy is the participation of the National Association of Entities Promoting Innovative Enterprises (Anprotec), an entity that acts as a national network of innovation environments and promotes the strengthening of its members for the benefit of the economy and society. As a partner of the EI project, Anprotec was responsible for carrying out activities to diagnose the maturity of innovation environments, for the *online qualification* of leaders in the management of innovative environments and for the preparation of the Implementation, Development and Operation Plans of the innovation environments of each Federal Institute.

The institutional governance arrangement demonstrates the articulation between government agencies, institutions of the Federal Network and support entities, highlighting the strategic coordination of Setec/MEC, the operational execution by Ifes, the technical and financial support of partners such as Sebrae, Anprotec and Facto, and the role of the institutions of the Federal Network in the implementation of the projects. This configuration reflects a collaborative model of public policy aimed at strengthening the ecosystem of innovation and entrepreneurship in the educational sphere.

Regarding the approved projects, Figure 1 shows the distribution of the 60 approved proposals, which included all regions of Brazil, with the Southeast standing out with 18 projects (30% of the total), especially in Minas Gerais, which had 9 approved projects (15%). The Northeast was also well represented with 17 projects (28%). The projects were divided among the areas of Economy 4.0, 23 in Agriculture 4.0 (38.3%), 17 in Industry 4.0 (28.3%) and 20 in Services 4.0 (33.4%).

**Figure 1**

*Distribution of projects approved in the Innovative Entrepreneurship Notice*



Source: The authors (2025).

In total, 1,127 people, including students, professors and civil servants, participated in these projects. There is a predominance of professors and administrative technicians, totaling 659 participants, evidencing the central role of these professionals in the coordination, orientation and execution of project activities. In relation to the student body, the participation of secondary/technical level (237) and higher education (229) students stands out, which reinforces the integration between different levels of training within the scope of the Federal Network. On the other hand, the participation of graduate students, as volunteers, is significantly lower (2), indicating a still incipient involvement of this specific public in the project's actions. In general, the data show the multidisciplinary and interinstitutional character of the initiative, as well as its ability to mobilize different profiles of actors in the educational innovation ecosystem.

#### 4 METHODOLOGY

To evaluate the results of the Innovative Entrepreneurship Project, a methodological approach was adopted based on the triangulation of different types of data, combining primary and secondary sources, with the objective of increasing the analytical robustness and reliability of the results. The triangulation allowed the confrontation of perceptions, documentary evidence and empirical data, enabling a more comprehensive analysis of the effects of the project within the scope of the Federal Network of Professional, Scientific and Technological Education.

With regard to secondary data, two main sets of sources were considered: (i)

institutional documents related to the Innovative Entrepreneurship Project, including public notices, technical reports, normative instruments and accompanying materials; and (ii) scientific, technical, and legal productions related to innovation, entrepreneurship, and Economy 4.0 policies. These sources supported the theoretical, institutional and normative contextualization of the study, in addition to supporting the interpretation of the empirical data.

As for the primary data, structured questionnaires were applied and in-depth interviews were conducted with coordinators of the projects selected within the scope of the IE. Quantitative data collection was carried out through the SurveyMonkey platform, using a questionnaire composed of 28 closed questions, organized into previously defined analytical categories. The categories and their respective objectives are described in Chart 1.

**Table 1**

*Analysis categories and objectives*

Category	Purpose of the questions
Profile	Profile of respondents, projects and institutions.
Perception	Capture the coordinators' vision on innovative entrepreneurship and promotion strategy, including priorities, selection criteria and integration with other initiatives.
RD&I resources	Evaluate the facilities and material support for RD&I activities, as well as the coordinators' satisfaction with the human, financial and technological resources provided by the Innovative Entrepreneurship Project.
Arrangement political-institutional	Evaluate the institutional arrangement established, the role of the agents involved in the implementation and management of the program and the respective counterparts.
Side Effects ( <i>Spillovers</i> )	Identify the results and impacts achieved (direct, indirect, foreseen and unforeseen) with the development of projects, in the various dimensions of Economy 4.0 and in society.

Source: Prepared by the authors (2025).

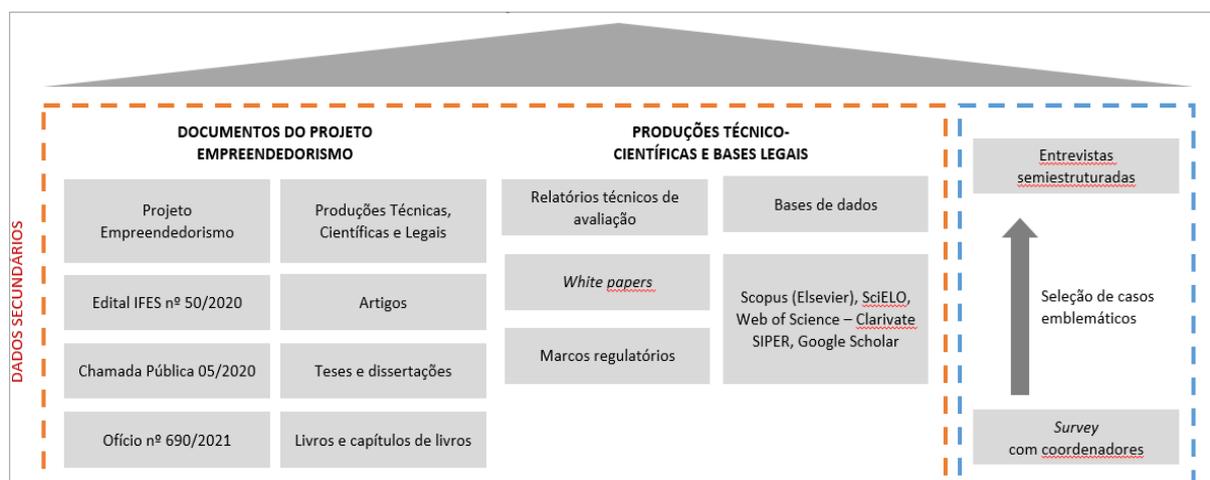
All participants were previously informed about the objectives of the research, ensuring transparency and consent. All coordinators answered the questionnaire, configuring a complete census of the supported projects. In addition, six in-depth interviews were conducted, selected based on the criterion of diversity of the innovation results presented by the projects, which allowed the qualitative exploration of aspects not fully captured by the quantitative instrument. Data analysis was conducted in an integrated manner, articulating primary and secondary information.

Figure 2 summarizes the data sources and collection techniques used in the research, evidencing the methodological triangulation strategy adopted in the study. Integration between secondary and primary data is observed, in order to increase the analytical consistency of the results. In the set of secondary data, the institutional documents of the Innovative Entrepreneurship Project stand out, as well as technical-scientific productions and

legal bases, including evaluation reports, articles, theses, dissertations, books, *white papers*, regulatory frameworks and specialized databases.

**Figure 2**

*Data sources and evaluation techniques*



Source: Prepared by the authors (2025).

The primary data, in turn, were obtained through the application of a survey with project coordinators and semi-structured interviews, based on the selection of emblematic cases. This methodological arrangement allowed the articulation of different perspectives and levels of evidence, strengthening the analysis of the results and the understanding of the project's impacts.

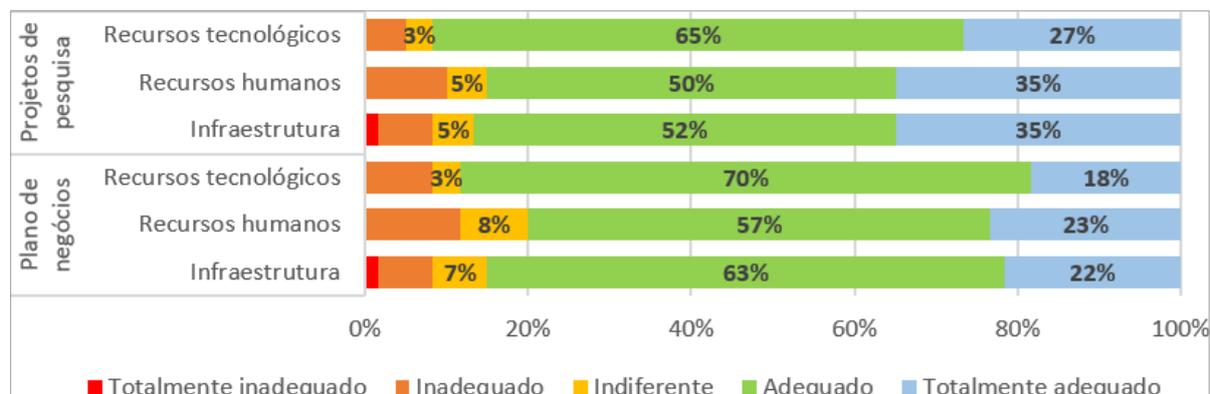
## 5 RESULTS AND DISCUSSIONS

The results obtained from the questionnaires applied to the project coordinators and from the in-depth interviews were organized into seven analytical categories: (i) research and development (R&D) activities that generate innovation; (ii) learning and generation of skills; (iii) technical and scientific publications; (iv) new products, processes and services; (v) dissemination of the culture of entrepreneurship and innovation; (vi) intellectual property; and (vii) new ventures. The following empirical findings are presented and discussed in an integrated manner, in line with the objectives of the study:

**(i) Research and development (R&D) activities that generate innovation:** the resources made available by Setec/MEC were mainly directed to the expansion of the research infrastructure of the institutions of the Federal Network, enabling the acquisition of specialized software, databases and technological equipment. According to the survey data, 91% of the coordinators stated that the funding positively impacted the research infrastructure and the scientific and technological knowledge base of their institutions (Figure 3).

**Figure 3**

*Evaluation of the adequacy of the inputs provided for the development of research projects and business plans*



Source: Prepared by the authors (2025).

The testimonies collected reinforce this result, indicating that, in many cases, the projects filled pre-existing structural gaps in laboratories and research environments. Despite this, some of the coordinators reported difficulties related to the processes of management and provision of materials, considered bureaucratic or inadequate to the deadlines of the projects. Even so, the investments contributed to institutional strengthening, including the incorporation of advanced equipment, such as 3D printers, which boosted new research and partnerships.

From an analytical point of view, these results corroborate the literature that points to infrastructure as a central element for strengthening innovative capacities in public institutions, especially in regional contexts where resources are historically limited. The IE project, in this sense, acted as an instrument to reduce structural asymmetries within the Federal Network.

**(ii) Learning and competence generation:** the results indicate that the IE project contributed significantly to the development of technical, intellectual and behavioral skills among students and teachers. Coordinators reported advances in skills such as critical thinking, creativity, communication, leadership, teamwork, and problem-solving. The involvement of students in practical innovation and extension activities increased their self-confidence and favored reflections on professional trajectories that began to include entrepreneurship and applied research as concrete possibilities.

The interviews also show relevant impacts on the professors, especially in the development of managerial and leadership skills, associated with the coordination of more complex projects. For many researchers, this was the first structured experience of managing multidisciplinary teams and interacting with agents outside the academic environment.

These findings dialogue with studies on entrepreneurial education, which highlight experiential learning as a key factor for the formation of entrepreneurial skills. The IE project proved to be relevant by promoting a gradual change in the way students and researchers perceive the relationship between research, innovation and practical application.

**(iii) Technical and scientific publications:** although the generation of publications was not a central objective for all projects, the results indicate that 22 initiatives produced articles, books or chapters, including publications in high-impact international journals. These productions contributed to increasing the visibility of the projects and strengthening academic and institutional collaboration networks.

Part of the teams chose to postpone scientific dissemination, following guidelines from the National Sebrae related to the preservation of the novelty of the solutions developed, especially in cases with potential for intellectual protection. This result highlights a recurrent tension between the times of open science and the strategies for the protection and economic valorization of knowledge.

**(iv) New products, processes and services:** more than half of the projects (57%) reported some type of innovation. Most of these innovations were classified as incremental, focusing on regional markets, especially in the agricultural sector. These are, in general, improvements in existing products, processes or services, adapted to the territorial specificities of the participating institutions.

As can be seen in Figure 4, almost half of the innovations developed (47%) are associated with some intellectual property protection mechanism, mainly patents and *software registrations*. In cases where there was no generation of final products, the coordinators highlighted the relevance of the institutional experimentation and learning process, reinforcing the role of the project as a space for testing and capacity development.

**Figure 4**

*Characteristics of the type of innovation produced and its scope*



Source: Prepared by the authors (2025).

These results indicate that the EI contributed more strongly to the generation of incremental and contextualized innovations than to disruptive innovations, which is compatible with the profile of the institutions and the stage of technological maturity of the projects.

**(v) Dissemination of the culture of entrepreneurship and innovation:** the data show that the performance of Anprotec and Sebrae was widely recognized by the coordinators as a central element for the dissemination of the culture of entrepreneurship and innovation. The training actions, mentoring and events favored the incorporation of entrepreneurial practices both in research activities and in teaching.

More than 60% of respondents reported involvement in organizing or leading events focused on innovation, promoting interaction between universities, companies and other organizations. These results suggest that the project generated lasting effects on the institutional culture, going beyond the formal period of validity of the supported initiatives.

**(vi) Intellectual Property:** at the time of the survey, 63% of innovations were not yet protected by formal intellectual property mechanisms. Part of the projects were in the process of protection, while others opted for industrial secrecy or evaluated the protection as unnecessary, either due to technical limitations or market strategy.

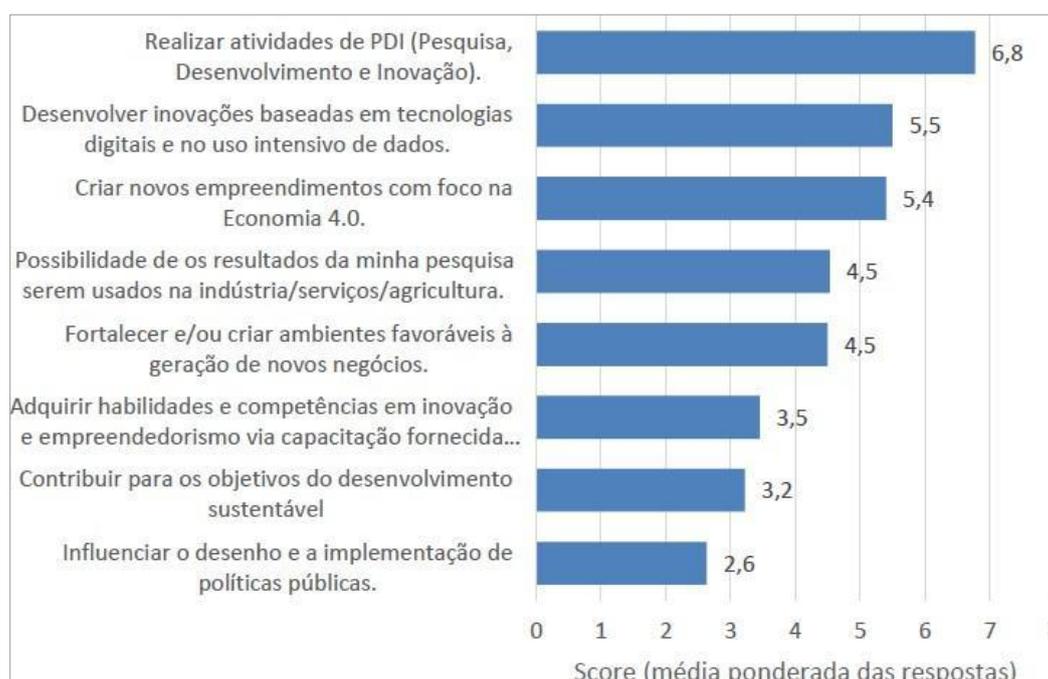
Despite this, the projects that advanced in protection processes reported relevant gains in terms of skills associated with intellectual property management, including market

analysis, branding strategies and valuation of intangible assets. These results reinforce the role of the IE project as a training space also in the field of IP.

**(vii) New ventures:** the main motivation for accessing the resources of the Innovative Entrepreneurship project was the performance of research, development and innovation (R&D) activities, pointed out by 51.7% of the coordinators, followed by the development of digital technological innovations, as shown in Figure 5. The creation of new ventures appeared as a secondary objective in the set of projects analyzed, reflected in the constitution of four startups at the end of the period studied. This result indicates that, although the project has contributed to the strengthening of the entrepreneurial culture and to the generation of technological solutions, the direct conversion of initiatives into companies was still limited in the first cycle of the policy.

**Figure 5**

*Ranking of motivations for access to EI project resources*



Source: Prepared by the authors (2025).

This result indicates that, although the Innovative Entrepreneurship project has consistently contributed to the strengthening of the entrepreneurial culture within the Federal Network, the direct conversion of projects into new ventures remained limited in the first cycle analyzed. This scenario can be explained by a set of structural and institutional factors, among which the still incipient contact of the teams with investors and market agents, the low technological maturity of part of the solutions developed and the priority attributed by the

coordinators to applied research activities to the detriment of the immediate incorporation of companies stand out.

From a public policy perspective, these findings suggest that instruments such as the Innovative Entrepreneurship project are particularly effective in strengthening institutional capacities, building entrepreneurial skills, and generating incremental innovations, especially in educational and scientific settings. However, in order to expand the creation of new ventures and the commercialization of the solutions developed, it is necessary to articulate with complementary mechanisms, such as investment funds, technological scaling programs, test environments and more robust policies for technology transfer and approximation with the productive sector.

The investments made by Setec/MEC had a relevant impact on the research infrastructure of the institutions of the Federal Network, by enabling the acquisition of software, advanced equipment and other essential inputs for research, development and innovation activities. These investments contributed to the creation of an institutional environment more favorable to experimentation, interinstitutional cooperation and the formation of partnerships, in addition to potentially favoring the integration of these institutions into national initiatives for sharing scientific and technological infrastructure.

In addition to the structural effects, the projects analyzed provided participants with significant opportunities to develop entrepreneurial skills, such as creativity, leadership, adaptability, and teamwork, skills considered central in contexts of high uncertainty. The intensification of collaboration between universities, companies and support organizations, combined with training actions conducted by entities such as Sebrae, contributed to the dissemination of a culture of entrepreneurship and innovation with lasting effects on academic practices, teaching activities and professional trajectories of students and teachers.

Despite these advances, the low prioritization of the creation of new enterprises by the project coordinators highlights important limits of the policy analyzed. The experience reinforces that the transition from applied research to the market requires not only financial resources and training, but also greater integration between entrepreneurial education, market strategies and competitive dynamics of the productive sectors. In this sense, the survey underlines the importance of strengthening entrepreneurial training with a focus on business models, market validation, and technological scaling.

Finally, the results dialogue with broader challenges of the Brazilian national innovation system, marked by weaknesses in university-industry interactions and by an entrepreneurship pattern characterized by a high rate of early-stage initiatives, but low innovative intensity and reduced generation of qualified jobs, which is a phenomenon often

described as an "entrepreneurial trap". Overcoming this situation requires policies that balance stimulating the creation of new ventures with strengthening innovation capacity and growth ambitions, avoiding an excessively restricted focus on Economy 4.0 technologies and incorporating other strategic areas for economic and social development.

## 6 CONCLUSION

This article analyzed the implementation and results of the Innovative Entrepreneurship project, launched by the Ministry of Education (MEC) in 2020, with the objective of supporting and developing innovation and entrepreneurship projects in the institutions of the Federal Network of Professional, Scientific and Technological Education. The initiative sought to strengthen the articulation between education, science and innovation, exploring the potential of these institutions in the generation of applied knowledge and technological solutions, especially in the context of Economy 4.0.

The results showed significant impacts on the research infrastructure and knowledge base of the participating institutions. The funding made available by Setec/MEC proved to be fundamental for the acquisition of technological inputs, software and equipment, contributing to the strengthening of institutional capacities for research, development and innovation. In addition, the project favored the consolidation of applied research and entrepreneurship practices, expanding the institutions' performance in strategic technological areas.

A relevant social impact was also observed associated with research and innovation grants, which contributed to the permanence and income of students involved in the projects, while promoting the development of technical, managerial and entrepreneurial skills among students and professors. The dissemination of the culture of entrepreneurship and innovation occurred through a comprehensive strategy, supported by institutional partnerships, scientific events, training and participation in fairs and business events.

However, the findings indicate that the creation of new ventures was not the main motivation of the coordinators to join the project, reflecting in a limited number of *startups* generated. This result highlights challenges related to the technological maturity of the solutions, the approach to investors and the need to deepen entrepreneurial training, connecting more effectively the concepts of innovation to market dynamics.

By inserting these results in the broader context of the Brazilian entrepreneurial environment, the study dialogues with the literature that points out weaknesses in the university-industry articulation and the persistence of the so-called "entrepreneurial trap", characterized by high entrepreneurial activity with low levels of innovation and generation of qualified jobs. In this sense, the research reinforces that the advancement of innovative

entrepreneurship in Brazil requires a balance between the number of entrepreneurs, their capacity for innovation and their growth ambitions.

Finally, the results indicate that the consolidation of innovative entrepreneurship in the country requires the expansion of the strategic focus of public policies beyond the technologies associated with Economy 4.0, incorporating other economic sectors with potential for regional development and value generation. The strengthening of entrepreneurial education, the intensification of the articulation between academia and industry, support for the commercialization of innovation and the encouragement of the protection of intellectual property emerge as central elements. In this context, the continuity, improvement and institutionalization of the Innovative Entrepreneurship project as a structuring public policy are essential to promote innovation, productive diversification and sustainable economic growth in the country.

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