

Analysis of Absorptive Capacity: a Study in Business Incubators in the State of Santa Catarina*

Análise da Capacidade de Absorção: um Estudo em Incubadoras de Empresas do Estado de Santa Catarina

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Abstract: This study aims to understand how the incubators in Santa Catarina – CELTA, MIDITEC, SOFTVILLE, INOVAPARQ, Instituto GENE, CRIE, INCHTeCh – support their incubated companies in absorbing external knowledge for their innovative efforts in products and services. This research is characterized as a multiple case study of a descriptive nature with a qualitative approach. Semi-structured interviews are conducted with incubator managers and explored through content analysis based on Zahra and George's (2002) absorptive capacity theory categories: acquisition, assimilation, transformation, and exploitation. It is concluded that the incubators present four practices supporting incubated companies in the acquisition of external knowledge, eight practices in the assimilation of knowledge, seven practices in the transformation of knowledge, and five practices in the exploitation of knowledge. A comparative assessment of incubator practices ranks them as follows, in descending order: MIDI Tecnológico, CELTA, INOVAPARQ, SOFTVILLE, with CRIE, INCTECh, and Instituto GENE tied in score.

Keywords: Absorptive Capacity; External Knowledge; Technological Incubators.

Resumo: O objetivo deste estudo é compreender como as incubadoras de Santa Catarina – CELTA, MIDITEC, SOFTVILLE, INOVAPARQ, Instituto GENE, CRIE, INCHTeCh – apoiam as empresas incubadas quanto a absorverem conhecimentos externos em seus esforços inovativos em produtos e serviços. Esta pesquisa caracteriza-se como um estudo de múltiplos casos, de natureza descritiva com abordagem qualitativa. Realiza-se entrevista semiestruturada com gestores das incubadoras, exploradas por meio de análise de conteúdo, com base nas categorias da teoria da capacidade de absorção de Zahra e George (2002): aquisição, assimilação, transformação e exploração. Conclui-se que as incubadoras apresentam quatro práticas que apoiam as empresas incubadas na absorção do conhecimento externo na dimensão aquisição, oito práticas na assimilação do conhecimento, sete práticas na transformação do conhecimento e cinco práticas na exploração do conhecimento. Avaliação comparativa das práticas das incubadoras aponta o seguinte ranking, em ordem decrescente: MIDI Tecnológico, CELTA, INOVAPARQ, SOFTVILLE, e empatadas em pontuação CRIE, INCTECh e Instituto GENE.

Palavras-chave: Capacidade de Absorção; Conhecimento Externo; Incubadoras Tecnológicas.

JEL Classification: O3; O30; O32

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1 INTRODUCTION

For companies operating in environments where constant change predominates, innovation enables them to generate competitiveness and survival. Thus, by emphasizing innovation, Schumpeter (1982) stands out as a reference. Innovation is a dynamic element of economic activity and the driving force of capitalism because when used as a tool, it enables an increase in capital and profitability for companies, generating, in addition to growth, economic development.

As impacts associated with the economy advance, technological innovation must increasingly be recognized as a relevant fact. According to Lalkaka (2002), technological innovation is a process that transforms an idea into a saleable product or service, while also contributing to increased productivity and competitiveness, which drive economic growth. Along the same lines, Freeman and Soete (2008) point out that a country's development is associated with its level of technology, given that science and technology are crucial for economic growth. Therefore, they state that there is no economic growth without technological change, given that technological innovations generate and result from new investments, contributing to business competitiveness (Freeman; Soete, 2008).

Knowledge is one of the main inputs for innovative development, so it becomes a necessary and sought-after resource for companies. They indeed rely on internal knowledge to innovate. Still, this is sufficient in many cases, leading them to resort to external knowledge (Machado; Fracasso, 2012; Jaeger Neto; Luciano; Testa, 2013). In an effort to face the competitive environment and better position themselves to sustain competitive advantages, companies seek training, seeking, according to Teece, Pisano, and Shuen (1997), to create dynamic capacity, considered a resource to respond proactively to the changing environment. To this end, as Cohen and Levinthal (1990) point out, they develop strategies, among which are those related to integrative capabilities, especially the absorption of knowledge from external sources. Also, they state that the company with greater absorptive capacity tends to have better conditions to create and use knowledge, including external knowledge, providing rapid responses to the pressures the environment demands (Cohen; Levinthal, 1990).

Later studies, such as that of Zahra and George (2002), indicate that absorptive capacity is sufficiently flexible and can be applied in different units of analysis and in the most diverse fields of research, such as industrial organization, organizational learning, strategic management, and innovation. According to Zahra and George (2002), absorptive capacity is defined as a set of organizational routines and processes through which companies acquire, assimilate, transform, and explore knowledge, with the aim of producing dynamic capabilities. Other studies, such as those developed by Camisón and Forés (2010), Spila, Rocca, Ibarra (2010), and Chauvet (2014), analyzed the capacity to absorb external knowledge with an emphasis on micro, small, and medium-sized companies.

In the context of this last line of concern, it is known that small businesses face many weaknesses and, therefore, in order to mitigate them, a mechanism was created to enable their emergence and gradual strengthening, known as a business incubator. During the incubation period, the emerging company obtains several benefits, such as physical space, managerial and administrative training, administrative and operational support services, communication facilities, technological assistance, and subsidies on the cost of services, among others. Therefore, knowing how incubators create conditions for incubated companies to absorb external knowledge to develop innovative processes becomes disturbing.

The state of Santa Catarina is the 2nd most prominent hub of technology-based companies in the country and has 22 technology-based incubators. Technology-based incubators are distributed regionally and present in the main municipalities of economic generation in Santa Catarina. Among these, the incubators of the Business Center for the Development of Advanced Technologies (CELTA) and the Micro Technological Industrial District (MIDITEC), located in Florianópolis, are references; the SOFTVILLE Technological Incubator and the Technological Innovation Park of Joinville and Region (INOVAPARQ) in Joinville; the Instituto GENE in Blumenau; the Regional Center for Innovation and Entrepreneurship (CRIE) in Tubarão; and INCHTECH in Chapecó.

Therefore, this study aims to understand how business incubators in the technology-based sector – software – in Santa Catarina (SC) support incubated companies in developing the capacity to absorb external knowledge. That said, this article is structured into five sections. This 1st section presents its purpose; the 2nd section is dedicated to the theoretical framework on absorptive capacity; the 3rd section indicates the methodological procedures; the 4th section characterizes the incubators under study and analyzes the absorptive capacities developed; the 5th section conducts a summary and general assessment of the practices aimed at absorptive capacity, and, finally, the 5th section concludes.

2 ABSORPTIVE CAPACITY: theoretical-analytical elements

Dynamic capabilities are those developed by organizations to integrate, build, and reconfigure their internal and external skills to navigate dynamic environments. These skills go through the process of searching in the external environment and adapting to the internal environment, making it possible to create specific skills for organizations (Wang; Ahmed, 2007). Therefore, the dynamic capabilities are known as integrative knowledge absorption capabilities, in which external sources are added to the internal skills of the various departments existing in a given company (Cohen; Levinthal, 1990).

Highlighted within dynamic capability is the capability to absorb new knowledge, which provides a window of opportunity to identify, assess, and incorporate external ideas and practices into company routines. To this end, companies are increasingly incorporating what they can from external knowledge to drive innovation and improve their performance. Absorptive capacity is seen as one of the critical learning processes of companies for identifying, assimilating, and exploiting external knowledge.

The concept of the term absorptive capacity is originally related to the seminal work in which Cohen and Levinthal (1989) coined the expression, adapting the original macroeconomic concept to the context of companies, and discussing the differences existing in the absorptive capacity of companies, depending on their learning incentives in the environment where they are inserted. In a later study, Cohen and Levinthal (1990) presented a new view of this construct, emphasizing the cognitive aspects underlying the learning process, and establishing three dimensions. The first is related to the organization's ability to recognize the value of external knowledge, and therefore, the organization's previously existing knowledge and its diversity are the decisive factors for absorbing new knowledge; the second establishes that the company must assimilate new external knowledge so that it can be internalized after recognizing its usefulness; and the third advocates that the company needs to be able to apply new knowledge for commercial purposes.

Absorptive capacity represents a different type of learning within a company, going beyond an automatic process, in which companies simply acquire more practice and efficiency to repeat the already used process. Cohen and Levinthal (1990) argue that absorptive capacity allows companies, when analyzing their processes and products, to do something different from their common sense, due to the external knowledge absorbed and added to the organizational background, with the aim of assisting future assimilation of new knowledge.

Along these lines, organizational integration becomes indispensable through the company's absorptive capacity, as does the solid communication structure between the external and internal environments (Cohen; Levinthal, 1990). These same authors present the idea that assessing and using external knowledge is intrinsically related to the company's level of prior knowledge, as explained in the first dimension mentioned, with the relationship between the company's learning and absorptive capacity being a highlight in their studies.

The highlighted contributions were significant, but the most relevant reconceptualization of absorptive capacity was proposed by Zahra and George (2002), with the publication of the article: *Absorptive Capacity: a review, reconceptualization, and extension*. In this article, they define absorptive capacity as a dynamic capability, adding that absorptive capacity, combined with the company's strategy and its innovation performance, leads it to obtain a competitive advantage. They point out that using knowledge constitutes a differentiator between companies and represents a way of obtaining competitive advantages in the market. They propose four dimensions for absorptive capacity: acquisition, assimilation, transformation, and exploitation, centered on two sets: potential absorptive capacity and realized absorptive capacity.

The company acquires, analyzes, interprets, and understands external knowledge in the first set- potential absorptive capacity. This capability encompasses acquisition and assimilation. However, although this capability enables the analysis of external knowledge, it does not ensure its exploitation. According to Zahra and George (2000), such capability depends on the technical competence of the company's sectors and professionals.

In turn, the second set – realized absorptive capacity – involves the company's ability to transform and explore new knowledge, incorporating it into its operations. We find transformation and exploration in this set since, according to Zahra and George (2002), the realized absorptive capacity requires exploring new knowledge and incorporating it into its operations. Therefore, it is necessary to ensure that the accumulated knowledge results in benefits for companies, developing and improving routines to combine new knowledge acquired from the external environment, aiming at future exploration. To this end, the company must invest in research and development (R&D), the accumulation of knowledge, and learning processes, thus expressing the ability to transform and explore new knowledge and convert it into innovations and competitive advantages.

In the acquisition dimension, the importance of the company recognizing, identifying, assessing, and acquiring external knowledge relevant to developing its operations stands out. Therefore, it is crucial to identify and obtain knowledge from external sources (e.g., suppliers, universities, and customers, among others), and the efforts in this process involve intensity, speed, and direction.

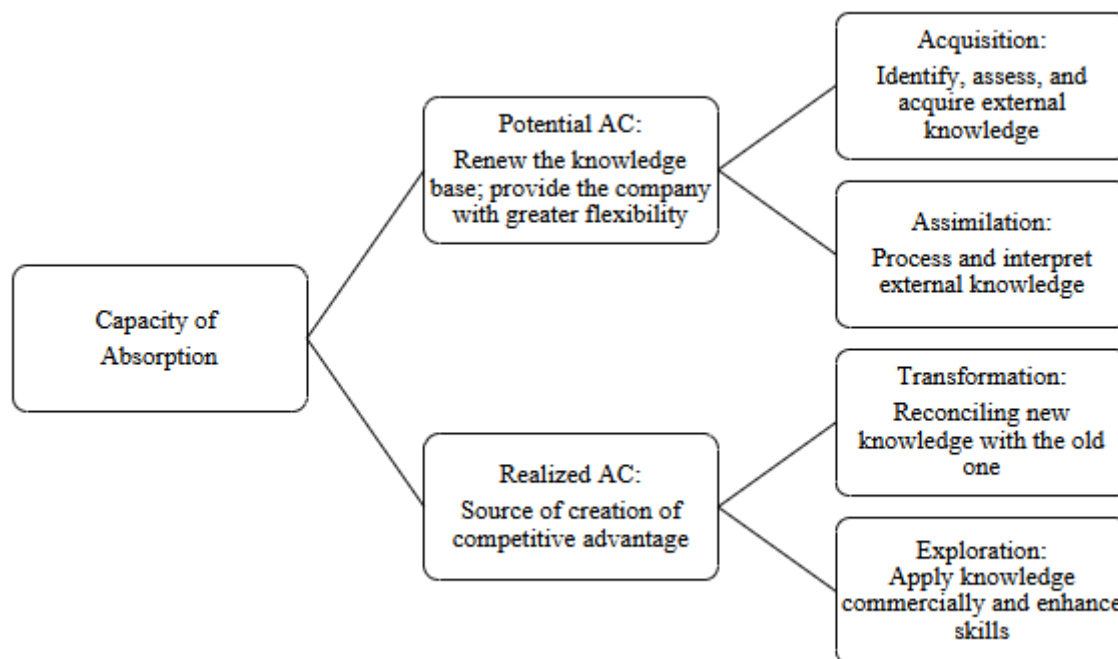
In the assimilation dimension, the company can develop processes and routines to analyze, interpret, and understand knowledge acquired externally. This depends on the company's prior knowledge base and the ability to associate new information with the collective base.

The transformation dimension refers to how companies redefine their routines to combine accumulated resources and knowledge with new experiences, creating new insights and skills. Zahra and George (2002) show that knowledge transformation requires developing and improving routines that facilitate combining existing knowledge with external knowledge acquired and assimilated for later use.

The exploration dimension involves improving routines based on acquired skills and transformed knowledge, allowing companies to develop new skills or improve existing ones. It is about producing something new based on transformed knowledge. Internal knowledge dissemination is essential to incorporate the knowledge acquired, assimilated, and transformed into the company's operations.

Zahra and George (2002) highlight the importance of simultaneously developing and managing all dimensions of absorptive capacity to improve organizational performance, emphasizing that the acquisition and assimilation of external knowledge are fundamental but insufficient unless the acquired knowledge is transformed and explored in new products and processes.

Figure 1 – Theoretical dimensions of potential absorptive capacity – acquisition and assimilation – and realized absorptive capacity – transformation and realization.



Source: Prepared by the authors based on Cohen and Levinthal (1990); Zahra and George (2002); Jiménez-Barrionuevo et al (2011).

Finally, it is noteworthy that subsequent empirical studies validate the concept and dimensions originally proposed by Zahra and George (2002). In this respect, the research by Lane, Koka, and Patha stands out. (2006); Todorova and Durisin (2007); Wang and Ahmed (2007); Vega, Gutiérrez, Fernandes (2008); Murovec and Prodan (2009); Volberda, Foss, Lyles (2010); and, Barrionuevo, Morales, Molina (2011).

3 METHODOLOGICAL PROCEDURES

In methodological terms, in this work, we chose to conduct multiple case studies to understand how Santa Catarina incubators support incubated companies to absorb external knowledge in their innovative efforts in products and services. In this context, a descriptive work, with a qualitative approach was conducted. The semi-structured interview procedure was used to collect primary data with managers of the seven incubators in Santa Catarina. Thus, the target population comprises seven business incubators in Florianópolis, Joinville, Blumenau, Tubarão, and Chapecó, associated with ANPROTEC. To reach this population, a list made available by the association mentioned above was consulted (<http://www.anprotec.org.br>). Chart 1 lists the seven incubators studied, their coordination, and the location of each one.

To analyze primary data, Bardin's Content Analysis (2016) was used, which considers the stages of pre-analysis, material exploitation, and data processing and interpretation. Pre-analysis consists of organizing the material to be used; and the material exploitation includes the decomposition and categorization of the procedures defined previously and the treatment of the results of the inferences and interpretations. As a content analysis technique, categorical analysis was chosen.

Chart 1 – Selected technology-based incubators in the State of Santa Catarina.

Incubator	Coordinating institution	Location
CELTA – Business Center for the Development of Advanced Technologies	Foundation of Reference Centers for Innovative Technologies – CERTI	Florianópolis
MIDI Tecnológico Incubator	ACATE/SEBRAE	Florianópolis
SOFTVILLE Technological Incubator	UNIVILLE, UDESC, and SOCIESC	Joinville
INOVAPARQ Incubator	UNIVILLE, UDESC, Catholic, UFSC	Joinville
Instituto GENE	FURB	Blumenau
CRIE Incubator – Regional Center for Innovation and Entrepreneurship	UNISUL – Universidade do Sul de Santa Catarina	Tubarão
INCTECH – Unochapecó Technology Incubator	UNOCHAPECO	Chapecó

Source: Prepared by the authors, 2024.

The analysis category used was the mixed grid, starting from the four previously defined categories, based on the theoretical approach used in the study. The dimensions of absorptive capacity defined in categories are acquisition, assimilation, transformation, and exploitation. Subcategories emerged from interviews with managers of the seven incubators analyzed, as shown in Chart 2.

Based on the mapping of practices found in the selected incubators and which facilitate the absorptive capacity of the incubator companies, some classification criteria were adopted. Chart 3 presents the criteria by which the incubators were classified: level 0, when they do not have or do not execute the practice; level 1, when they intend to structure the practice; level 2, in a situation where the incubator already has the practice structured, but has points for improvement; and, level 3, when the practice is structured.

Chart 2 – Analysis Categories

Analysis category	Subcategories
Acquisition	Organizing networking coffee sessions, happy hour, meetups, and workshops, with benchmarking, interaction with the university, exchanging information with partners, exchanging information between incubated companies.
Assimilation	Monitoring the maturity of companies; support for internationalization; benefits offered for the qualification of incubated companies, internal communication channels, mentoring offered; entrepreneur development programs, formal and informal meetings.
Transformation	Monitoring the maturity of companies, working groups, pre- and post-incubation modalities, and relationships between incubated companies and other companies in the ecosystem.
Exploitation:	Actions to bring investors and financing sources closer together, rapprochement with large companies/industries, company graduation, business rounds, and support for knowledge production.

Source: Prepared by the authors, 2024.

Chart 3 – Classification criteria for the analyzed incubators

Level	Classification criteria
0	Does not have/perform the practice
1	Intends to implement the practice or is it at an early stage?
2	The practice has been implemented. However, there are points for improvement
3	Practice is structured

Source: Prepared by the authors, 2024.

Based on the content presented in the last table, levels were established for each practice found in the incubators analyzed, causing each incubator to rank based on the researchers' classification. Subsequently, each manager of each incubator studied validated the classification and ranking of the organization under their responsibility.

4 ANALYSIS OF KNOWLEDGE ABSORPTIVE CAPACITY IN BUSINESS INCUBATORS

4.1 Identification of CELTA, CRIE, INCTECH, INOVAPARQ, Instituto GENE, MIDI Tecnológico, and SOFTVILLE Incubators

The Business Center for the Development of Advanced Technologies (CELTA) incubator was the first created in Santa Catarina, starting its activities in Florianópolis in 1986, in an initiative arising from network interactions with the Reference Centers for Innovative Technologies (CERTI). The incubator aims to support technology-based companies and stimulate and support the creation, development, consolidation, and interaction with the business and scientific environment. The success achieved, close to reaching four decades of existence and with several awards for the best incubator in the country, is due to the management model adopted, which includes partners, such as the Municipal Government of Florianópolis, the State Government, the Universidade Federal de Santa Catarina, and business entities (CELTA, 2023).

The Regional Center for Innovation and Entrepreneurship (CRIE) incubator, located in Tubarão, has been working since 2005 to make micro and small business projects viable, offering technical, managerial, and infrastructure support. The incubator facilities are at Shopping Unisul, at the Unidade Universitária de Tubarão. CRIE is maintained by the Universidade do Sul de Santa Catarina (UNISUL) and has links with the Teaching, Research, and Extension Management (GEPEX). From the incubation stage onwards, interaction occurs between the incubated companies and educational and research institutions, companies, government agencies, professional associations, and others (UNISUL, 2023).

The UNOCHAPECÓ Technological Incubator (INCTECH), located in the municipality of Chapecó, supports the creation of new technology-based companies, fostering economic development and contributing to the generation of employment and income. Since 2003, INCTECH has been characterized as a program to promote emerging companies and support and create new technology-based businesses and local economic development. It constitutes a space that enables technology transfer for innovation via research projects, maintained by the Universidade Comunitária da Região de Chapecó – UNOCHAPECÓ.

The Technology-Based Incubator of the Technological Innovation Park of Joinville and Region (IBT – INOVAPARQ), located in Joinville, began its activities in 2014 with the IBT – Inovaparc Pre-Incubation Program. Its objective is to provide space, qualification,

and experience for entrepreneurs interested in developing innovative projects, which, in the future, could become companies. INOVAPARQ partners with Parque Industrial Perini Business Park in Joinville, a private entity that houses national and multinational companies. Another notable factor is the incubator's proximity to partner universities, such as UNIVILLE and UFSC (INOVAPARQ, 2023).

The Instituto GENE was founded in 2002 due to the dedication of a group of professors from the Universidade Regional de Blumenau – FURB. The beginning was marked by the development of the Gene-Blumenau business incubator, an extension project of the FURB Systems and Computing Department, supported by CNPq through Sociedade Softex in its pioneering Genesis Project. The incubator aims to promote multisectoral development by stimulating and supporting innovation and entrepreneurship. The incubator has consolidated within the academic structure and the market, generating new companies to increase business competitiveness. Likewise, it has also stimulated the generation of innovative companies, realizing the role of research as a driver of innovation, professional improvement and development, and social inclusion through disseminating access to new technologies (Instituto GENE, 2023).

The Santa Catarina Association of Technology Companies (ACATE) has been working since 1986 to promote the development of the technology sector in Santa Catarina. It establishes links between the technology sector, teaching and research centers, and financing agencies, aiming to offer benefits and growth instruments to technology-based companies. Resulting from a partnership between ACATE and the Support Service for Micro and Small Businesses of Santa Catarina (SEBRAESC), the MIDI Tecnológico technology-based business incubator was created in 1988, and, in recent times since 2013, it has been guided by an intense relationship between the incubator and startups, with a greater focus on the personal development of entrepreneurs and more direct support in marketing and sales (MIDI Tecnológico, 2023).

The SOFTVILLE incubator, located in the city of Joinville, began as part of an initiative to increase integration and synergy between companies, government, and educational institutions. In 1995, the SOFTVILLE Foundation was made official, but the incubator only started its incubation process in 2001, and the first graduations took place in 2005. Over time, it has consolidated as an organizational structure focused on serving two basic lines of action: training and advice to companies that use the foundation's services and assisting new ventures, encouraging research into new products and services, and the generation of specialized jobs (SOFTVILLE, 2023). The incubator has five maintainers: UDESC, UNIVILLE, SOCIESC, Union of Data Processing and IT Companies of Joinville, and the Municipal Government of Joinville.

4.2 Incubator practices that facilitate the absorption of external knowledge

4.2.1 Knowledge acquisition

The CELTA incubator has several routines that facilitate the acquisition of external knowledge, such as networking coffee sessions, happy hour, meetups, workshops, benchmarking, interaction with the university, and exchanging information with partners and between incubated companies. The incubator holds happy hours among incubatees to facilitate the exchange of knowledge and experiences between them, as these meetings allow both the acquisition of information regarding the entrepreneurial process and the exchange of experiences of good practices between companies, in addition to ensuring synergy for business partnerships.

Knowledge acquisition is also seen in the exchange of experiences and workshops the incubator promotes. The practices highlighted allow the creation of environments for the exchange of knowledge. The CELTA incubator proposes this type of situation to encourage sharing information from the practice. Benchmarking occurs through interaction with other agents in the ecosystem. The company that stands out in the incubator becomes a benchmark, a reference for others. This format allows for different views on the same problem, with the possibility of debates and discussions in the most varied contexts, allowing knowledge acquisition.

The interaction with universities stands out in this incubator, which occurs informally. With this interaction, entrepreneurs can acquire new knowledge by conducting product tests in laboratories at partner universities. At CELTA, interaction occurs with regional universities, such as UFSC, UDESC, UNISUL, and UNIVALI. The exchange of information between the incubator partners and the incubated companies themselves demonstrates knowledge acquisition since such practices are work routines, the objective of which is to integrate the various existing players.

At CRIE, happy hours occur in more significant intervals and outside the incubator. For networking coffee sessions, held more frequently, with businesspeople to discuss issues that foster innovation in companies. These practices facilitate knowledge acquisition and ensure the flow of knowledge between incubated companies in a relaxed and informal manner. When the incubator coordinator was asked about which knowledge exchanges promote knowledge acquisition, benchmarking was mentioned since the incubator searches for best practices in other incubators in the state. The knowledge exchange with the CELTA and MIDI Tecnológico incubators was mentioned. This benchmarking practice is advocated by Flatten, Engelen, Zahra, and Brettel (2011) to acquire external knowledge.

Because the CRIE incubator is maintained by UNISUL and is located very close to the university, interaction with the university occurs frequently since the difficulties encountered by companies are resolved with the support of the university, which, in addition to offering infrastructure, makes its teaching team available to companies. Interaction with the university encourages the acquisition of new ideas for incubated companies. The acquisition of external knowledge is seen through contact with incubator partners and between the companies, given that such interaction routines enable the identification of new knowledge. The incubator's main

partners are the Tubarão Business Association (ACIT), the Association of Micro and Small Businesses and Individual Entrepreneurs of Tubarão (AMPE), the National Industrial Training Service of Tubarão (SENAI), and the Union of Accountants of Tubarão and Region (SINDICONT).

Knowledge acquisition at the INCTECh incubator can be seen during networking coffee sessions. These incubator events involve all directors of Unochapecó and all incubated companies, promoting, with this initiative, the search for relevant information and, thus, allowing innovation by the incubated companies. Therefore, with networking coffee sessions, the incubator promotes meetups, which involve, in addition to potential investors, the incubated companies and other startups in the region. This practice enables knowledge exchange and converts competitive intelligence into action plans for the incubator.

The knowledge acquisition in the INCTECh incubator is also seen through benchmarking, considering that this practice enables the search for relevant information about companies' businesses and makes companies create new knowledge and innovations. According to the interview, INCTECh benchmarking occurs between incubators from other Brazilian states, such as Goiás, Rio de Janeiro, Rio Grande do Sul, and Minas Gerais. In turn, the interaction between the incubator and the university highlights the knowledge acquisition by the incubated companies. It was reported that entrepreneurs seek out the incubator to incubate their businesses as it is located on the UNOCHAPECÓ premises.

Knowledge acquisition in the INOVAPARQ incubator can be seen through meetups held under its leadership. The meetups are held every two weeks, and, to this end, topics are brought up for debate between the incubated companies and the incubator management. Benchmarking occurs at the incubator through events held by ANPROTEC, where the incubator management participates. These events encourage the exchange of ideas and facilitate acquiring new knowledge from other incubators in Brazil.

Because the INOVAPARQ incubator is maintained by FURJ and managed by three regional universities, UNIVILLE, UDESC, and UFSC, the interaction between the incubator and the universities is very close. This interaction occurs through university research groups and the courses and departments, enabling knowledge acquisition by the incubator, increasing its knowledge base, and passing it on entirely to the incubated companies.

The networking coffee sessions, held at the Instituto GENE, occur every two weeks, when people who have already been through the incubator are invited, such as former incubatees. They mention topics related to innovation and entrepreneurship, focusing on the development of Blumenau. By promoting such practice, the Institute aims to enable the acquisition of new knowledge for the incubator and the incubated companies. Knowledge acquisition is also observed when the incubator interacts with MIDI Tecnológico and CELTA incubator in Florianópolis and other incubators in Santa Catarina.

The interaction between the Instituto GENE and FURB, the university that maintains the incubator, enables the acquisition of external knowledge, as the incubator promotes events together with the university and connects entrepreneurs with FURB students. This interaction allows companies to acquire information and identify necessary knowledge from external sources, such as university sources.

MIDI Tecnológico expresses knowledge acquisition through workshops. The interview shows that the incubator holds practical events that are offered to the incubated companies. MIDI Tecnológico frequently conducts benchmarking, and, as evidenced in the interview, the incubator sets goals for the team to learn about other existing practices in the world. By bringing experiences from different places, the incubator acquires information that enables the identification of relevant knowledge from external sources. Benchmarking promotes changes in the incubator's internal processes.

Interaction with the university in MIDI Tecnológico occurs through the UFSC knowledge engineering research group, Via Estação Conhecimento, and with the innovation and management laboratory at UFSC. Both interactions are formalized via agreement. These interactions with universities, however, go beyond formalities, as the incubator welcomes students and professors to connect with the innovation ecosystem. The incubator receives undergraduate and graduate students for research, enabling the incubator to acquire knowledge. Furthermore, as they come from universities, entrepreneurs maintain connections and develop existing knowledge throughout incubation.

When analyzed in the SOFTVILLE incubator, the knowledge acquisition dimension is seen through content meetings. These meetings are opportunities for networking and exchanging experiences between the companies present, facilitating the acquisition of new technologies, innovations, and knowledge. In addition to networking meetings, meetups are held in partnership with the city hall and other innovation agents in the city. The main objective of this event is to acquire new experiences. In addition to these practices, interactions with coordinating institutions: UNIVILLE, UDESC, and SOCIESC. These higher education institutions train professionals to work in the technology-based segment and enable the exchange of relevant technological information.

In order to obtain information, the SOFTVILLE incubator, in partnership with an accelerator in São Paulo, promotes the Colisões program as a facilitator of knowledge acquisition. This program provides workshops to train entrepreneurs, encourage ideas to be put into practice, and help entrepreneurs experience the day-to-day difficulties of a startup. The incubator proposes this situation to promote the sharing of knowledge that originates in training and the transfer of it to individuals.

4.2.2 Assimilation

Monitoring the performance of companies incubated at CELTA highlights the dimension of knowledge assimilation since, every semester, it hires a third-party company to assess the companies. This assessment aims to identify potential improvements in the various areas of the companies, signaling qualification needs. After determining the maturity of companies, the incubator provides benefits to them, such as courses, advice, and training, highlighting that, in the CELTA incubator, all benefits are aimed at meeting the requirements of the CERNE methodology.

The CELTA incubator, in addition to the courses, advice, and training mentioned, has an internationalization process called *GO! Global Opportunities for Innovation*, which focuses on analyzing and identifying the needs of companies for their internationalization process, proposing solutions to their insertion or increased participation in the international market. When analyzing the internal communication process between the incubator and the incubated companies, it became clear that an information system was used as the main channel, which is used to exchange existing and necessary information between the incubator's administration and the entrepreneurs, and in some cases, email is also used. This information system also allows for the rapid flow of information and ensures effective communication of relevant information.

Knowledge assimilation also occurs through formal and informal meeting routines between the incubator management and the incubated companies. These meetings exchange experiences on new developments, problems, and achievements. Meetings are an integration factor essential for knowledge dissemination among the organization's members (Zahra; George, 2002).

Monitoring the maturity of companies incubated at CRIE enables the assimilation of new technologies and crucial needs for developing companies. By identifying the real needs of companies, the incubator can promptly offer ways to implement the ideas of the incubated companies. The courses, training, and mentoring offered by the CRIE incubator involve advice provided by professors from the university, in addition to companies receiving support from partners to meet their needs in terms of qualification, as in the case of SEBRAE and SENAI. CRIE offers advice on technology, economics, business management, law, and accounting.

The incubator does not hold periodic formal meetings; informal meetings exist between the incubated companies and the incubator's coordination, in conversations that end up being individual and informal, without a defined frequency. These meetings between the incubated companies and the coordination facilitate knowledge assimilation and exchange achievements and difficulties between the companies.

Knowledge assimilation is facilitated by the INCTECH incubator through support for internationalization, which is given to the incubated companies. Several actions are developed, such as participation in fairs and events, partnerships, mentoring, etc. Support for internationalization allows companies to assimilate new technologies from other countries and enable the exchange of information through the flow of new knowledge arising from missions, in which the UNOCHAPECÓ board participates.

To train entrepreneurs, INCTECH offers benefits such as legal, technological, financial, accounting, software, and marketing advice, digital marketing courses, assistance in developing business plans, technical training, preparation of projects to raise funds and analysis and monitoring of incubated businesses. It was evident in the interview that businesspeople first exchange ideas through courses and training and only seek advice to solve specific problems.

It was noted that the INCTECH incubator stimulates knowledge transformation in incubated companies by promoting networking coffee sessions, holding meetups, using the pre-incubation method through the relationships between incubated companies and other companies in the ecosystem, organizing workshops, and monitoring the maturity of companies.

To enable companies to constantly update themselves and use the mistakes made during the incubation process to consolidate in the market, the INOVAPARQ incubator develops indicators to monitor them, analyze and place them in a phase decided by managers so that they assimilate the knowledge and identify their needs.

Support for internationalization also goes hand in hand with knowledge assimilation, as the incubator offers support and all the necessary support for entrepreneurs to assimilate the culture of internationalization, which is the first step towards the company's maturity. Unlike other countries, in general, entrepreneurs in Brazil are more focused on serving and conquering the Brazilian market, as opposed to the possibility of knowing and operating in international markets. The incubator offers support to develop entrepreneurs and startups through mentoring sessions, which occur every two weeks when the incubator management assesses needs and responds promptly to the difficulties encountered in each business situation.

In order to leverage the business of companies incubated at the Instituto GENE, the incubator's management developed a method for monitoring the maturity of these companies, which is measured by a score pre-defined by management, enabling the monitoring of the companies' evolution and the definition of guidelines.

By monitoring the maturity of companies, the incubator enables them to assimilate the knowledge acquired and, based on the identification of needs, offers benefits to the incubated companies. The Instituto GENE, with the aim of training managers of incubated companies, offers training lasting eight to ten months. These trainings are focused on digital marketing planning, financial projections, raising investments, and management through OKR, which is geared towards structuring a process in companies to define and achieve goals. In the same way as the benefits made available to companies, mentoring contributes to knowledge assimilation by companies.

Knowledge assimilation occurs through assessments, which are called Checkpoints in the case of the MIDI Tecnológico incubator.

The assessments of each company allow them to interpret new knowledge since, by analyzing the current situation, the company can improve its subsequent processes through the knowledge acquired. In MIDI Tecnológico, there is also the Strategic Management Program, in which the strategic business plan is prepared and monitored every six months, with indicators and goals for incubated companies monitored monthly by the incubator.

Regarding the national and international missions in which the incubator participates, knowledge assimilation is perceived, considering that the incubator participates in missions with the representation of the ACATE board, with the aim of benchmarking with other players in the innovation ecosystem to promote networking and with the vision of establishing partnerships for the institution. Support for internationalization is in line with knowledge assimilation since the incubator offers support and all the necessary support for companies to learn about international markets, map their external competitors, understand the particularities of each country regarding the target sector, and know how to identify risks and seek the necessary investments for this international insertion.

In turn, knowledge assimilation is seen at SOFTVILLE through monitoring the maturity of companies since this monitoring takes place individually and enables the incubated companies, after the return of the incubator management, to be able to analyze, classify, and process all the knowledge acquired, leveraging the maturity of the incubated companies.

At SOFTVILLE, the benefits offered to incubated companies include, in addition to advice, which follows the five CERNE axes, mentoring, guided by the incubator's coordination, and there are also training courses offered to entrepreneurs. Besides the benefits provided to companies, SOFTVILLE is one of the leading players in the city's training program, named Joinville startup. This program is a movement to support startups based on knowledge exchange, networking, and training for companies starting in the market.

4.2.3 Transformation

In the CELTA incubator, regarding transformation, the monitoring of the maturity of companies, the pre-incubation modality, and the relationship of the incubated companies with other companies in the ecosystem were identified. The pre-incubation modality offered by the incubator consists of a phase in which knowledge is also transformed when all the support given to entrepreneurs aims to help structure new ideas and mature existing ones. The pre-incubation phase enables the redefining of the routines of incubated companies and the combination of accumulated resources and knowledge with new experiences.

Thus, the pre-incubation process becomes essential for companies to validate existing ideas and for guidance from the incubator regarding new methodologies. In this sense, with the process enabling the generation of new ideas, the achievement of value in the market is expanded, leading to new ideas subsequently being considered innovation. In addition to the above, the strong relationship between the CELTA incubator and other companies in the ecosystem highlights the possibility for companies to transform knowledge and adapt technologies designed by different companies into their work routines.

The fact that the CRIE incubator is on the same floor as the Tubarão Technology Park, Uniparque, means that the interaction between incubated companies and companies already consolidated in the market also enables technological interaction between companies. This existing interaction aligns with the statements made by Camisón and Fóres (2010) when they recognize that knowledge transformation occurs when companies adapt technologies designed by others to their specific needs.

The way the incubator INCTECH transforms acquired knowledge, according to Kim (1998), with the internal capability to develop and refine routines facilitates the combination of existing knowledge with newly acquired and assimilated knowledge. Another routine that the incubator has is the pre-incubation modality. The support given by the incubator can establish a filtering process between the ideas coming from the entrepreneurs and the knowledge acquired and assimilated. As a result, the approach rounds, organized by the incubator, enable the acceleration of several companies abroad, a factor that allows them to respond to market demands and consistently seek to innovate since international experience enables replacing outdated knowledge.

In turn, the transformation was identified at INOVAPARQ when the incubated companies met to create work groups to resolve conflicts and generate ideas within the incubator. These working groups combine existing knowledge within companies with newly acquired or assimilated external knowledge. In this case, external knowledge comes from other incubated companies. With the possibility of using existing knowledge from entrepreneurs, the INOVAPARQ incubator offers the pre-incubation modality, connecting this knowledge with new ideas generated from all the support given by the incubator in the incubation process.

At the Instituto GENE, the transformation process was seen in the mentoring that this incubator offers to the incubated companies. These mentorships are given by former incubatees or by incubator partners, with the aim of qualifying entrepreneurs. The Institute provides the pre-incubation modality for companies that opt for the incubation process for their businesses. Pre-incubation in the incubator takes place for three to four months, a period in which companies are structuring their ideas and maturing them. At this stage, the incubator becomes essential for validating existing ideas, providing guidance on methodologies, generating ideas, identifying potential problems, and prospecting clients.

In MIDI Tecnológico, knowledge transformation was verified. The pre-incubation phase allows companies to combine existing knowledge with new knowledge acquired during the months when they were pre-incubated. The same occurs in post-incubation since companies already have knowledge of the incubation process and enjoy the opportunity to be connected to the startup ecosystem.

The connection with ACATE associates allows incubated companies to adapt the technologies associated companies use to their own realities, enabling the combination of existing knowledge with recently acquired and assimilated external knowledge. The fact that ACATE has 1500 members allows incubated companies to apply new knowledge in their work practices. One of the incubator's programs, Business Verticals, also works to integrate incubated companies with groups of other companies.

Knowledge transformation could be seen in the SOFTVILLE incubator through the relationships between the incubated companies and those in the innovation ecosystem. SOFTVILLE maintains relationships with consolidated startups, such as Conta Azul and Asaas, and through ACATE's Business Verticals. This interaction allows for exchanging knowledge, information, partnerships, etc.

4.2.4 Exploitation

The exploitation of new knowledge resulting from existing practices at CELTA is influenced by actions to approach investors and sources of financing. The incubator, as evidenced in the interview, encourages, in several ways, the approach of incubated companies with investors. One form analyzed in this study was training in developing pitches, consisting of a brief presentation to investors to attract them to buy your ideas. While creating these presentations, support results in companies investing in the incubator, facilitating the acceleration of companies in the market.

Among the aspects of knowledge exploitation identified at CRIE, the actions to bring together investors and sources of financing, company graduation, business rounds, and support for knowledge production stand out. Relationships with players with sources for funding, as well as with established companies, allow us to explore new knowledge, which is fundamental to developing innovative processes.

The result of companies graduating their businesses is a clear source of learning and knowledge exploitation at INCTECH, given that graduation enables companies to innovate, providing competitiveness and expanding their product portfolio, with the entrepreneur's initial knowledge being replaced by new knowledge acquired, assimilated, and transformed.

The exploitation of new knowledge, resulting from INOVAPARQ's routines and processes in the dimensions of knowledge acquisition, assimilation, and transformation, is influenced by actions to approach investors and sources of financing and by approach with large companies/industries through graduation of incubated companies and support for knowledge production. In this sense, the incubator follows the same practices developed by other peers, such as CRIE.

In turn, the support in knowledge production offered by the Instituto GENE by sharing necessary knowledge and experiences makes the exploitation dimension evident during this process, as projects are submitted to public notices by companies based on all the knowledge internalized during the incubation process. Once the project has been approved, we seek to explore the development of new products and processes linked to the active business areas.

MIDI Tecnológico has five processes that facilitate knowledge exploitation: actions to approach investors and sources of financing; actions to approach large companies/industries; the graduation of companies; business rounds; and support for knowledge production. The capability to explore knowledge in the incubator is seen when incubated companies complete the incubation phase, lasting up to 30 months, in the MIDI Tecnológico. After incubation, companies become graduates, considering they replace outdated knowledge with new knowledge.

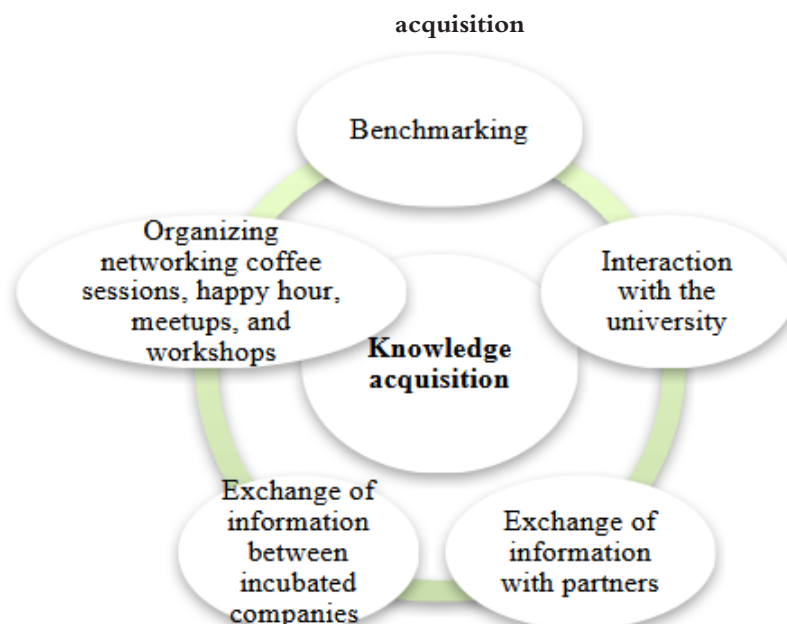
The incubator's ability to explore knowledge is seen when it supports incubated companies in being in contact with investors. SOFTVILLE interacts with the Santa Catarina Angel Investor Network; participates in meetings, such as Expoinovação; has contact with agents from the Santa Catarina State Development Agency (BADESC); and supports companies in making pitches. These interactions provide visibility for incubated companies to attract investors, exploring knowledge through the adoption of new technologies. Furthermore, SOFTVILLE's interactions with large companies, such as Whirlpool/Embraco, in Joinville, stand out.

5 INCUBATOR PRACTICES FOCUSED ON ABSORPTIVE CAPACITY: SUMMARY AND ASSESSMENT

By analyzing the statements obtained in the interviews with the managers of the seven incubators in Santa Catarina, the routines, processes, and support given to the incubated companies are highlighted, aiming to indicate which practices facilitate the absorption of knowledge in each dimension of the absorptive capacity. A summary of the results obtained was prepared based on the details provided for each incubator.

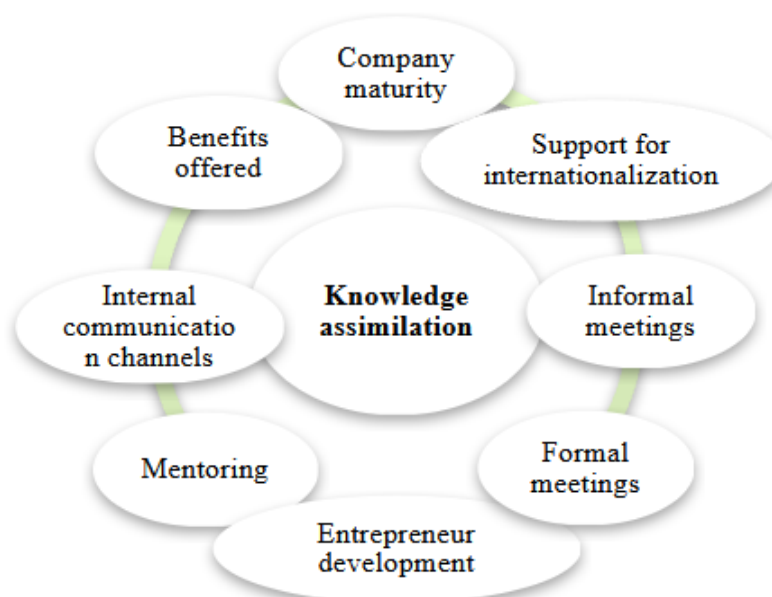
According to Figure 2, when analyzing the seven SC business incubators, five practices that facilitate the acquisition of knowledge are perceived: benchmarking, interaction with the university, the exchange of information with incubator partners, exchange of information between incubated companies, and the holding networking coffee sessions, happy hour, meetups, and workshops. According to Zahra and George (2002), such practices reflect the company's ability to conduct actions that make it possible to locate, identify, and assess external knowledge considered relevant to its operations. Elements such as trust, respect, reciprocity, and interaction are essential.

Figure 2 – Practices mapped in selected technology-based incubators in Santa Catarina that facilitate knowledge



Source: Prepared by the authors, 2024.

Figure 3 – Practices mapped in selected technology-based incubators in Santa Catarina that facilitate knowledge assimilation

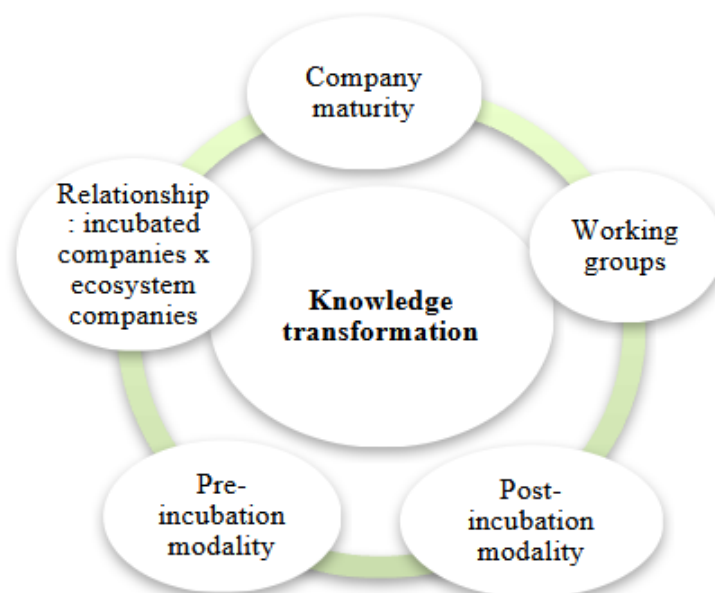


Source: Prepared by the authors, 2024.

From Figure 3, eight practices can be seen in business incubators that facilitate the assimilation of external knowledge, involving monitoring the maturity of companies; support for internationalization; benefits offered for the qualification of incubated companies (courses, training, and advice); internal communication channels used by the incubator; mentoring offered; entrepreneur development programs; formal meetings; and informal meetings. According to Zahra and George (2002), such practices concern the company's ability to understand external knowledge for possible domestic use. Therefore, other aspects are essential, such as language, compatibility, and complementarity.

When analyzing knowledge transformation, one can see five practices that facilitate the transformation of external knowledge. This dimension, as shown in Figure 4, involves creating working groups, pre- and post-incubation modalities, the relationship between incubated companies and other companies in the ecosystem where they are inserted, and monitoring the maturity of companies. For Zahra and George (2002), such practices represent the company's ability to combine existing internal knowledge with acquired and assimilated knowledge. The following aspects are present: communication, meetings, documents, transmission, and flow, and are considered relevant.

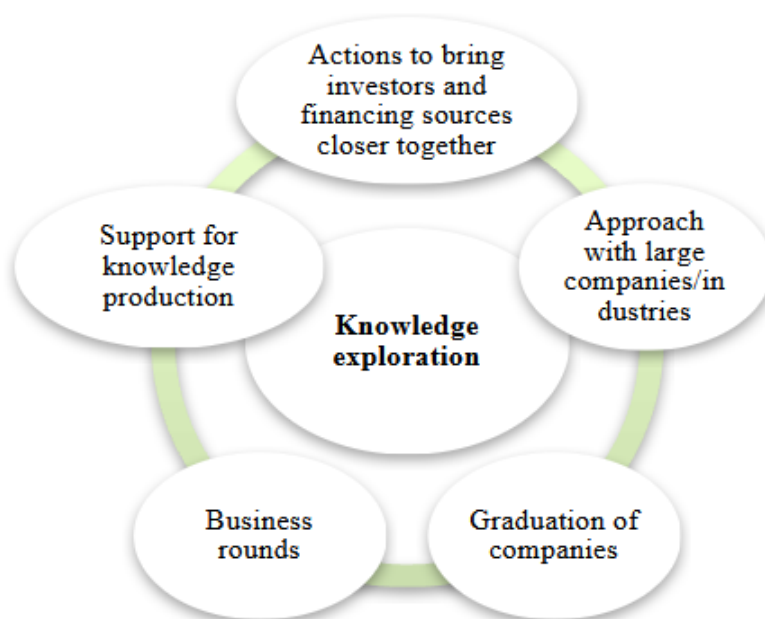
Figure 4 – Practices mapped in selected technology-based incubators in Santa Catarina that facilitate knowledge transformation



Source: Prepared by the authors, 2024.

Next, Figure 5 demonstrates the practices existing in Santa Catarina incubators that facilitate the exploitation of external knowledge. Business incubators facilitate knowledge exploitation by incubated companies through five practices: actions for approaching investors and sources of financing, approaching large companies/industries, graduating companies, business rounds, and support given for knowledge production. In fact, according to Zahra and George (2002), such practices indicate the company's ability to incorporate acquired, assimilated, and transformed knowledge into its daily operations. In this sense, other aspects are also involved, with responsibility for assuming such practice and putting into practice actions for the company's benefit.

Figure 5 – Practices mapped in selected technology-based incubators in Santa Catarina that facilitate knowledge exploitation



Source: Prepared by the authors, 2024.

Based on the syntheses regarding the practices mapped in the incubators, the practices identified in each are demonstrated according to the four dimensions of absorptive capacity, defined by Zahra and George (2002). Table 1 shows a summary of the mapped practices. Based on this mapping, a classification is created for each incubator, generating a final ranking, which compiles the overall performance of the seven incubators. Analyzing the above in Chart 4, one can see that:

a) In knowledge acquisition, the performance of the incubators is very balanced, ranging between 14 and 15, with 15 being the maximum score, demonstrating the incubators' general maturity in this dimension.

b) In knowledge assimilation, consisting of the largest number of practices (8), the score has a large variation. While the CRIE incubator obtained 13, MIDI Tecnológico achieved 22 out of a possible total of 24. This demonstrates a significant difference in

maturity in this dimension between the incubators. The practice with the highest mean was “Informal Meetings,” where all incubators achieved maximum scores. In the practices “Support for Internationalization” and “Entrepreneur Development Program,” a low mean is observed in both, demonstrating the need for improvement. The CELTA incubator also stands out in the “Support for the Internationalization” category of companies.

c) The knowledge transformation dimension has five practices. Of the maximum sum of 15 points, the MIDI incubator obtained a maximum score of 12 points. MIDI Tecnológico stands out due to the maximum score obtained in the “Post-Incubation Modality” practice, being the only incubator in the state to provide it. The “Working Groups” practice also draws attention because it is present in only two incubators (SOFTVILLE and INOVAPARQ), which is an interesting means of facilitating the transformation of knowledge on specific topics.

Table 1 – Classification of the types of practices aimed at absorptive capacity by selected technology-based incubators in Santa Catarina.

Dimensions of Knowledge Absorptive Capacity	CELTA	CRIE	INCTECH	Inovaparq	Instituto GENE	MIDI	Softville
Knowledge acquisition							
Organizing networking coffee sessions, happy hours, meetups, and workshops	3	3	3	3	3	3	3
Benchmarking	3	3	3	3	3	3	3
Interaction with the university	2	3	3	3	3	2	2
Exchange of information with partners	3	3	2	3	3	3	3
Exchange of information between incubated companies	2	3	3	3	2	3	3
Subtotal	14	15	14	15	14	14	14
Knowledge assimilation							
Monitoring the maturity of companies	2	2	1	1	2	3	2
Support for internationalization	3	0	1	2	0	1	0
Benefits offered for the qualification of incubated companies	22	2	3	2	2	3	3
Internal communication channels	3	3	3	3	3	3	3
Mentoring	0	3	0	2	2	3	3
Entrepreneur Development Program	0	0	2	1	0	3	0
Formal meetings	2	0	2	2	2	3	3
Informal meetings	3	3	3	3	3	3	3
Subtotal	15	13	15	16	14	22	17
Knowledge transformation							
Monitoring the maturity of companies	2	1	1	1	2	3	2
Working groups	0	0	0	2	0	0	3
Post-incubation modality	0	0	0	0	0	3	0
Pre-incubation modality	2	1	2	3	2	3	1
Relationship between incubated companies and other ecosystem companies	3	2	2	3	2	3	2
Subtotal	7	5	5	9	6	12	8
Knowledge exploration							
Actions to bring investors and financing sources closer together	3	2	2	2	2	3	2
Approaching large companies/industries	3	0	0	2	0	3	2
Graduation of companies	3	3	3	3	3	3	3
Business rounds	3	1	0	0	0	3	0
Support for knowledge production	2	2	2	2	2	2	2
Subtotal	14	8	7	9	7	14	9
OVERALL TOTAL	50	41	41	49	41	62	48

Source: Prepared by the authors, 2024

d) In the last dimension, knowledge exploitation, the CELTA and MIDI Tecnológico incubators are the positive highlights, scoring 14 out of a maximum of 15 points. In turn, the INCTECH incubator and the Instituto GENE scored 7, less than 50% of the maximum score. This is due to the low scores obtained in the practices “Approaching large companies/industries” and “Business rounds,” in

which neither of these two incubators implemented.

From Table 2, one can infer a significant difference in maturity between the incubators studied. The variation between the best-ranked incubator and the worst-performing incubator is 34%. It suggests the need for greater sharing of knowledge and experiences among incubators so that each can socialize its strengths and improve its difficulties.

The incubators CELTA, SOFTVILLE, and INOVAPARQ achieved very similar scores, with CELTA, in Florianópolis, being the second oldest incubator in the country, founded in 1986, and SOFTVILLE and INOVAPARQ located in the largest city in the state, both in terms of population and in terms of generating economic value: Joinville. The incubators CRIE, INCTECh, and the Instituto GENE, respectively based in Tubarão, Chapecó, and Blumenau, had the lowest performance. Unlike Blumenau, which has a long tradition in the technology sector in the state, Chapecó and Tubarão are consolidating in the segment. Despite its history and extensive experience, the Instituto GENE has faced difficulties in recent years that appear to have affected the quality of its incubation processes.

The reasons that led to the classification of the analyzed incubators involved assessing the experience, structure, and management of the incubators. The MIDI Tecnológico and CELTA incubators in Florianópolis obtained the best scores. In this case, the conditions that strengthen such incubators are linked to the fact, among others, that they have already consolidated institutional support – ACATE and CERTI Foundation; that there are several universities in the region, and that they have easy access to a significant number of state-based technology companies. In this regard, it is no coincidence that they received four awards as the best incubator in Brazil, granted by ANPROTEC.

Table 2 - Final ranking of practices aimed at absorptive capacity by selected technology-based incubators in Santa Catarina.

Ranking	Incubator	Location	Overall Sum
1st	MIDI Tecnológico	Florianópolis	62
2nd	CELTA	Florianópolis	50
3rd	INOVAPARQ	Joinville	49
4th	SOFTVILLE	Joinville	48
5th	CRIE	Tubarão	41
6th	INCTECh	Chapecó	41
7th	Instituto GENE	Blumenau	41

Source: Prepared by the authors, 2024.

Besides the reasons mentioned, the CELTA incubator also has a differential: the length of time the same director has been in the position, having held the position for 31 years. This enables constant knowledge dissemination among all incubated companies and an integrated vision of the entire ecosystem. Other notable differences include having management focused on supporting the internationalization of incubated companies, which leads incubated companies to take on more significant challenges; maintaining intense coordination to bring together investors and sources of financing; and maintaining an extensive network of international and national relationships.

The MIDI Tecnológico incubator demonstrated a capability for assimilating knowledge superior to others, resulting from the structured and consolidated processes offered to the incubated companies. Having ACATE as its managing entity, this incubator offers incubated companies the possibility of connecting with the most varied innovation agents.

The highlight of MIDI Tecnológico also derives from the structure of the entrepreneur development program, which is consolidated to meet the needs of entrepreneurs. The incubator also has structured pre- and post-incubation modalities essential to business development. Furthermore, it has a strong relationship between startups and large companies through ACATE's open innovation program.

6 CONCLUSION

This study is based on the analysis of the dimensions of knowledge absorptive capacity of Zahra and George (2002): acquisition, assimilation, transformation, and exploitation. This classic reference forms the basis for other research highlighting the importance of external knowledge for companies to build their dynamic capabilities and better position themselves in the market. We sought to answer the question: What practices are in place in Santa Catarina's technology-based incubators that facilitate the absorption of external knowledge by incubated companies? To answer this question, interviews were conducted with CELTA, CRIE, INCTECh, INOVAPARQ, Instituto GENE, MIDI Tecnológico, and SOFTVILLE incubator managers.

In acquiring external knowledge, evidence was found of practices that facilitate it and allow access to this base, highlighting the main references cited: meetings and workshops, benchmarking, and interaction with the university. Among the practices facilitating knowledge assimilation, the following stood out: training and advice, mentoring offered, and formal and informal meetings. In knowledge transformation, other practices were identified, the main ones being monitoring the company's maturity, the pre-incubation modality, and the relationship between incubated companies and other companies in the ecosystem. Regarding knowledge exploitation, the

following practices stood out as relevant: approach with large companies/industries, approach with investors and sources of financing, and support given for knowledge production.

Thus, based on the practices mapped in the seven incubators in Santa Catarina, it is concluded that, in knowledge acquisition, the performance of the incubators remained very balanced, demonstrating maturity in the institutional management of this form of organization. In knowledge assimilation, which consisted of the largest number of practices, there was a large variation in the scores between the incubators, with emphasis on the performance of MIDI Tecnológico, followed by the CELTA incubator and, for the other relevant practices mentioned, the scores given to formal and informal meetings stand out. MIDI Tecnológico stands out in knowledge transformation, presenting pre- and post-incubation modalities as relevant practices. This is followed by the positioning of the SOFTVILLE and INOVAPARQ incubators, with the practice of working groups as relevant. In knowledge exploitation, the CELTA and MIDI Tecnológico incubators are positive highlights, being references in all the practices mentioned in this dimension.

The classification in this study, regarding the level of structure in which the practices are found in the seven incubators analyzed, allowed a ranking to be drawn up. Thus, based on the scores obtained, the MIDI Tecnológico and CELTA incubators were positioned among the best, with MIDI taking first place. The incubators CELTA, SOFTVILLE, and INOVAPARQ achieved very similar scores, while the incubators CRIE, INCTECH, and Instituto GENE, respectively established in Tubarão, Chapecó, and Blumenau, achieved lower performance. In summary, the final ranking classification placed MIDI Tecnológico in 1st place, CELTA in 2nd, INOVAPARQ in 3rd, SOFTVILLE in 4th, and, in 5th, the others, with tied scores: CRIE, INCTECH, and Instituto GENE.

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