



Intrapreneurial universities in digital times - New ways of thinking and future challenges

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ABSTRACT

Despite extensive research on academic entrepreneurship and entrepreneurial universities, this special issue challenges conventional beliefs by examining intrapreneurship in academia. It aims to investigate how faculty and staff can adopt entrepreneurial behaviors and cultivate an entrepreneurial approach within their roles as researchers and educators, in diverse academic contexts. The 11 papers included in this issue span various domains of intrapreneurial universities, broadening the original concept beyond initial expectations set forth in the call for papers. Exploring a spectrum of intrapreneurial initiatives, this issue seeks to enhance understanding and broaden perspectives on intrapreneurial behaviors within universities through various research approaches and methodologies. Based on the contributions received, we reflect on theoretical and practical implications and delineate future directions for academic intrapreneurship research.

1. Introduction

In the academic sphere, intrapreneurship is commonly understood as entrepreneurial activities occurring within established organizations (Abreu and Grinevich, 2013; Corbett et al., 2013; Audretsch et al., 2021; Klofsten et al., 2021; Guerrero et al., 2023). Intrapreneurship involves innovative practices within an organization, where employees initiate new business activities and pursue opportunities. Academic intrapreneurship, wherein scientists engage in knowledge utilization while remaining within academia, represents a significant yet underexplored aspect. While existing scholarly attention has examined entrepreneurial university themes like technology transfer, the presence of science parks and incubators, and academic entrepreneurship, focused exploration of specific activities within the entrepreneurial university approach and potential intrapreneurial dimensions remains lacking. However, academic intrapreneurs also generate internal value by securing funds, establishing new research centers, addressing societal challenges through policy influence, enhancing their university's reputation, and implementing innovative pedagogical initiatives that go beyond incremental course development.

Within university organizations, intrapreneurs are individuals who identify and exploit new ideas and opportunities, ultimately generating value and significance in their academic work, as well as in their future careers and capabilities (Youssef et al., 2021). Academics, whether they serve as researchers, educators, or hold intermediary roles within the university, possess the capacity to act entrepreneurially and contribute to the development of new activities and organizations within their institutional context. They may choose to remain within the university environment and leverage their professional roles to nurture innovative ideas and establish new ventures, thereby creating added value within their respective organizations (cf. Vanhaverbeke and Peeters, 2005;

Stuart and Ding, 2006).

Earlier studies indicate that universities either symbolically integrate intrapreneurship into their structures and academic processes or are prevented from doing so by existing dominant institutional logics. In this sense, it is crucial to recognize the heterogeneity that exists within university organizations. Previous research has, for example, indicated that academics in natural sciences and technology tend to prioritize the creation of spin-off companies as the primary outcome of entrepreneurial activities, while those in arts and social sciences place greater emphasis on the social dimensions of entrepreneurship, focusing on organizing activities that address societal challenges (Bienkowska et al., 2016). Moreover, the university environment itself plays a pivotal role, impacting researcher mobility, networking, external collaboration, and related factors, which, in turn, influence the propensity for entrepreneurship within the academic context (Bienkowska and Klofsten, 2012; Muñoz et al., 2018). It is important to note that universities, as large organizations with several sub-organizations, each possessing unique structures, processes, and cultures, have shaped academia over centuries. Institutional logics, governing academic research and teaching activities in higher education, encompass norms, established rules, idea systems, and thought processes. While academics have traditionally navigated the competing logics of teaching and research, there's a potential negative relationship between these roles, hindering progress. In the face of institutional complexity, the rise of the entrepreneurial university introduces a third role—that of intrapreneurs—and a new logic—the intrapreneurial logic—in the academic context. This further complicates the already strained relationship between existing teaching and academic logics. Related to that, some scholars (Guerrero et al., 2023) suggest managing multiple logics through organizational structures, while others acknowledge the resilient nature of institutional logics, advocating for navigating rather than resolving competing

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demands, roles, and logics on an individual level.

Moreover, within the university landscape, it is imperative to investigate the transformative role of digitalization and its far-reaching implications for intrapreneurial opportunities. It becomes crucial to navigate the distinctions among closely related terms, as highlighted by Brem and Radziwon (2017). Examining the intersection of intrapreneurship, academic disciplines, and digitalization provides a nuanced perspective that sheds light on the evolving dynamics of entrepreneurial endeavours within the academic realm. Secundo et al. (2020) contribute to this discourse by identifying key themes in the digital academic entrepreneurship literature. These themes encompass the utilization of digital technologies for entrepreneurship education, the strategic deployment of digital tools to unearth entrepreneurial opportunities, and the cultivation of entrepreneurial competences within the expansive realm of digital “university-based” entrepreneurial ecosystems. Their insights emphasize the transformative potential of digitalization not only in shaping educational practices but also in fostering a conducive environment for entrepreneurial initiatives. Notably, Youssef et al. (2021) offer a specific lens on the impact of digital technologies on education and how educational experiences influence the entrepreneurial intent of students. Their work underscores the pivotal role played by the digital entrepreneurship ecosystem in facilitating and catalysing various stages of entrepreneurial processes within the academic setting. In amalgamating these factors, a comprehensive exploration of the interplay between intrapreneurship, diverse academic disciplines, and the pervasive influence of digitalization emerges. Researchers engaging in this multidimensional analysis stand to gain a deeper understanding of the complexities and nuances that characterize intrapreneurial activities within the dynamic and ever-evolving landscape of the university context. This holistic approach recognizes the transformative potential of digitalization as a catalyst for innovation and entrepreneurial thinking, reshaping the traditional paradigms of academia.

2. The scope of the special issue

This special issue undertakes a comprehensive exploration of the multifaceted dimensions of intrapreneurship within the university setting. While extensive research over the past decades has investigated various facets of academic entrepreneurship (Klofsten and Jones-Evans, 2000; Opizzi, 2023), the entrepreneurial university (Etzkowitz et al., 2019), and the engaged university (Breznitz and Feldman, 2012), the specific realm of intrapreneurial processes within these institutions remains relatively unexplored. The existing body of research encompasses a broad spectrum of sub-areas, including technology and knowledge transfer (Markman et al., 2005), internal factors influencing entrepreneurial initiatives (Tece, 2018), institutional determinants (Guerrero and Urbano, 2012), entrepreneurial teaching and learning methodologies (Fayolle and Gailly, 2015), industry engagement by academics (Perkmann et al., 2021), the dynamics of entrepreneurial universities in emerging economies (Dalmarco et al., 2018), innovation systems and ecosystems (Brem and Radziwon, 2017), and the assessment of the impact of the entrepreneurial university (Guerrero et al., 2015).

While prior special issues, guided by scholars such as Perkmann et al. (2013), Guerrero et al. (2016), and Klofsten et al. (2019), predominantly focused on the entrepreneurial university itself, our special issue takes a new approach by delving into intrapreneurship within the academic context. The primary aim of this special issue is to fill the existing research gap by conducting a thorough investigation into intrapreneurial processes within the dynamic landscape of university environments. This focused exploration is anticipated to make a significant contribution to the evolving field, specifically shedding light on intrapreneurship and its implications for universities and stakeholders in the social and economic spheres.

Whereas recent studies have examined intrapreneurial capabilities within remote education (Guerrero et al., 2021) and explored

intrapreneurial behaviours and employee commitment within universities (Valka et al., 2020), there is a need to further broaden our understanding of intrapreneurial processes within the academic context. Despite extensive research on entrepreneurial behaviours and activities in universities, such as student start-ups, academic spin-offs, and commercialization efforts, there remains a limited investigation into intrapreneurship within the academic setting. This research void underscores the necessity for an in-depth analysis of how intrapreneurial behaviours can be seamlessly integrated into university management teams. This may involve the cultivation of intrapreneurial mindsets and the adoption of strategic intrapreneurial orientations. Additionally, there is a pressing need to foster an intrapreneurial identity among students and researchers through dedicated entrepreneurial university activities. These initiatives might include intrapreneurial education programs, the creation of value through intrapreneurial research projects, and the commercialization of intrapreneurial tech initiatives. Naturally, this goes also beyond the university boundaries. Here, it must be considered that ecosystem embedding also plays a key role in the transition path towards an entrepreneurial university. Just by being geographically close to ecosystem partners, will not guarantee cooperation success (Giones and Brem, 2017).

Conducting this research will not only enhance our understanding of intrapreneurship within academic institutions but will also provide valuable insights for the development of effective strategies and frameworks to foster intrapreneurial initiatives in the academic context.

3. Intrapreneurial universities - the impact of internal factors

Numerous internal factors identified in prior research are deemed crucial for fostering an intrapreneurial orientation within universities (Clark, 1998; Guerrero and Urbano, 2012). Key contributors to the success of an intrapreneurial university’s orientation include visionary intrapreneurial leadership, which is essential for cultivating a culture that motivates the university community—comprising students, faculty, researchers, alumni, and community engagement—to engage in intrapreneurial initiatives (Guerrero and Urbano, 2012).

Given that the governance and operational logic of a university shape the values and activities of its stakeholders (Crow et al., 2020), university managers must align resource allocation and strategies to establish an entrepreneurial innovation culture (Leih and Teece, 2016). This culture should respond to stakeholders’ needs during stable-uncertain times (Siegel and Guerrero, 2021) and evolving socio-economic paradigms (Guerrero and Dabić, 2023). University leadership is considered an essential dynamic capability, playing a crucial role in maintaining visibility, identifying opportunities, securing funding, making significant intrapreneurial contributions (Heaton et al., 2020; Guerrero and Menter, 2024), and rebuilding capabilities and business models for broad-scale social and economic transformation (Guerrero et al., 2021).

Establishing an intrapreneurial strategy that encourages innovation, proactivity, risk-taking, and creativity necessitates the creation of an intrapreneurial culture within universities (O’Shea et al., 2007). Intrapreneurial universities foster an entrepreneurial environment (Guerrero and Lira, 2023), inspiring their community to generate novel ideas converted into entrepreneurial innovation outcomes (Compagnucci and Spigarelli, 2020). This involves providing role models, university reward systems, and support programs (Huyghe and Knockaert, 2015) and reducing bureaucracy resistance to change (Crow et al., 2020). Additionally, an intrapreneurial culture must actively encourage inclusion, diversity, equity, and accessibility to mitigate structural disadvantages within the university community (Guerrero and Pugh, 2022; Choi et al., 2022; Waldman et al., 2022).

Financial resources play a crucial role for intrapreneurial universities (Clark, 1998), enabling the implementation of a strategy to build an intrapreneurial culture and finance support programs and structures (e. g., research centers, incubation-acceleration programs,

Table 1
Summary of papers.

Authors	Focus and outcomes	Method(s)
Flores, Grimaldi, Poli & Villani	Strives to improve comprehension of the mechanisms that lead to the emergence of an intrapreneurial university. How universities navigate internal changes, organize resources and competencies, and cultivate intrapreneurial abilities.	Single case study elucidates the processes facilitating the conversion of individual-level abilities into organizational intrapreneurial capabilities.
Lundqvist & Williams-Middleton	The study investigates the impact of over 25 years of entrepreneurial activities on the development of an entrepreneurial university's missions, including education, research, and its third mission. Entrepreneurial activities have enhanced the university's third mission and positively impacted its education and research missions, showcasing the evolution of pragmatic and moral legitimacy within the university community and beyond.	Qualitative research methods, including longitudinal case study analysis and interviews with faculty and students engaged in entrepreneurial activities at the university.
Henry & Lahikainen	Challenging assumptions about entrepreneurial success in universities by examining the intrapreneurial dimensions of their activities. Unveils universities' significant involvement in intrapreneurial pursuits, deepening understanding of their activities and intrapreneurial dimensions, while introducing an analytical framework to emphasize the intrapreneurial university.	In-depth, qualitative approach to investigate the entrepreneurial activities of five universities across multiple countries.
Engzell, Karabag & Yström	Explores the experiences of intrapreneurs in the academic context and proposes an integrative framework to understand organizational and individual-level responses to multiple logics, with a focus on intrapreneurial outcomes. Universities actively uphold academic logic, identified as a barrier by intrapreneurs, prompting them to refine skills and actively hybridize logics. Intrapreneurs leverage multiple logics, incorporating elements of intrapreneurship, teaching, and research, while universities integrate intrapreneurial logic into their operational processes.	Utilizes qualitative analysis on data from nineteen intrapreneurs across three universities to unveil how these individuals navigate and respond to institutional complexity and multiple logics
De Keyser & Vandenbempt	The dynamics of academic intrapreneurship reveal two interconnected processes—academic exploration and entrepreneurial exploitation—underscored by contrasting institutional logics. Highlights how academics navigate four specific logic conflicts, emphasizing the time-dependency of academic intrapreneurship and its paradoxical nature.	Building on a qualitative case study of a European university
Paget, Le Gal & Goulet	The study explores researchers assuming the role of intrapreneurs by developing decision support systems from scientific research outputs, investigating individual motivations, organizational barriers, and opportunities within the context of their home institution. The pivotal role of individual motivations, which may clash with institutional concerns, particularly regarding products beyond the institution's typical expertise, underscoring the need for research institutions to carefully consider investing in finalized decision support systems.	Utilizes qualitative methods through interviews with researchers, computer engineers, support services staff, and senior-level managers.
Nafari, Honig & Siqueira	The paper explores universities' role in social and economic change, emphasizing academic social intrapreneurship in the digital realm. Academic entrepreneurship, as revealed in the study, unveils a novel model of intrapreneurship within academia, showcasing universities' non-pecuniary contributions to society and emphasizing the significance of legitimacy and decentralized innovation.	Employing a descriptive case study approach, examining the emergence and activities of an international virtual incubator, highlighting the potential of digitally implemented academic social intrapreneurship to address global challenges.
Abreu & Grinevich	Aims to develop a systemic concept of intrapreneurship in academia and empirically test it in neglected areas like graduate employability and wellbeing. The shift in academia's intrapreneurial ecosystem towards prioritizing graduate outcome quality over traditional metrics like job placement or start-up quantity, emphasizing the pivotal role of university stakeholder networks in enhancing graduate career satisfaction, start-up creation, and undergraduate employment.	Utilizes a combination of administrative and survey panel data from 141 UK higher education institutions.
Audretsch, Belitski & Scarra	How universities navigate internal changes, organize resources and competencies, and cultivate intrapreneurial abilities. Financial success of intrapreneurial academic spin-offs is influenced by the adoption of digital technologies, growth stage, and scientific field.	Data on 89 academic spin-offs in natural sciences and 660 spin-offs from other scientific fields in the UK between 2015 and 2019.
Shekhar, Satyanarayana & Chandrashekar	Examines the role and contributions of an academic incubator in fostering intrapreneurship in the academic environment. Incubators could play a pivotal role in driving institutional diversification, serving as a platform for nurturing intrapreneurial capabilities, and facilitating organizational learning.	Leveraging qualitative thematic analysis on primary data gathered from 34 interviews and supplemented with secondary data from diverse ecosystem stakeholders.
Masucci, Camerani, Corrocher & Scarlata	This paper examines the creation and development of an accelerator, identifying the factors that prompted its founding and guided its setup. It highlights both internal and external drivers, showing how the accelerator's structures leverage the university's strengths and resources. The roles of top management and internal champions in building consensus and negotiating solutions are emphasized. The findings demonstrate how intrapreneurship within the academy can balance value creation for both the university and its broader ecosystem by strategically managing stakeholder relationships.	In-depth case study approach, conducting several interviews with members of the accelerator, key university stakeholders, and external partners.

entrepreneurship education programs). These resources, obtained from government funding, private-sector investment, and philanthropic contributions (Schulte, 2004; Etkowitz, 2013), as well as revenue generation through commercialization, licensing/patenting intellectual property, and industry partnerships (Compagnucci and Spigarelli, 2020), must be maximized. Building an intrapreneurial ecosystem (Guerrero et al., 2020; Germain et al., 2023) involves creating sustainable funding models, aligning financial strategies with intrapreneurial goals, and investing in initiatives with the highest return on investment (Leih and Teece, 2016; Heaton et al., 2020).

A thriving intrapreneurial university ecosystem necessitates well-developed structures, effective entrepreneurial education programs, and various complementary support mechanisms (Wright et al., 2017). Common intrapreneurial structures include centers, labs, incubators, accelerators, and other facilities (Heaton et al., 2019; Guerrero et al., 2020). Supporting an environment requires entrepreneurial education programs equipping the university community with essential skills, knowledge, and mindset to pursue intrapreneurial goals (Bandera et al., 2021). Complementary mechanisms such as mentorship, specialized training, and coaching are essential for navigating intrapreneurial challenges (Guerrero and Lira, 2023).

4. Intrapreneurial universities - the impact of external factors

External (or environmental) factors exert a significant impact on universities' capacity to foster intrapreneurship and drive innovation. These factors encompass technological advancements and digitalization, industry trends, economic conditions, demographic shifts, global challenges, and institutional conditions. Technological advancements and digitalization offer tools for improved teaching, research, and collaboration, supporting organizational innovation. Industry trends and economic conditions necessitate curriculum adaptation to meet market demands, while demographic shifts call for flexible and personalized learning models. Global challenges present opportunities for universities to address societal issues, albeit with challenges such as adapting to technology and financial constraints, especially in response to institutional pressures (Guerrero and Urbano, 2012; Klofsten et al., 2019).

In broad terms, the institutional environment encompasses formal institutions (regulations, written rules, etc.) and informal institutions (cultural values, attitudes, etc.) influencing socio-economic performance (North, 1990, 2005). Applying North's framework to the development of intrapreneurial universities raises research questions, including the following: What institutional matrix can foster or inhibit the development of intrapreneurial universities? Are informal factors more crucial than formal ones for academic intrapreneurship processes? What motivates or demotivates academics to behave intrapreneurially? What external facilitators are needed to foster intrapreneurial processes in the academic context? What are the primary institutional conditions in the university intrapreneurial ecosystem? What type of (intra)entrepreneurship education do academic intrapreneurs (such as professors, PhDs, Postdocs, researchers, etc.) require? How can the intrapreneurial mindset be disseminated within universities? Why could an intrapreneurial culture be relevant for the development of entrepreneurial universities? What is the relationship between intrapreneurship within universities and socio-economic development?

Concrete formal factors encompass (a) courses for the university community focused on developing intrapreneurial skills, utilizing disruptive methodologies, and involving the entire university ecosystem; (b) managerial leadership and entrepreneurial organizational structures promoting intrapreneurial activities; and (c) support measures at the university level, fostering innovation, including ideation labs, research parks, (online) incubators, and accelerators. Informal factors include (a) positive attitudes toward intrapreneurship within the university community; (b) role models and initiatives promoting the intrapreneurial mindset; (c) reward systems supporting academic intrapreneurs; and (d) the prestige and legitimation of the intrapreneurial

career at the university. In this context, intrapreneurial universities leveraging institutional factors become catalysts for change in higher education and socio-economic performance.

5. Summary of the papers in the special issue

In this special issue, we have accepted 11 papers (see Table 1) that collectively contribute to a diverse array of areas within intrapreneurial universities, grouped into four domains, revealing perspectives and topics that expanded our initial concept of intrapreneurial universities beyond our expectations when we issued the call for papers.

5.1. Exploring the emergence of intrapreneurial universities

Improving the comprehension of mechanisms that lead to the emergence of an intrapreneurial university is the aim of the research by Flores, Grimaldi, Poli, and Villani. It examines how universities navigate internal changes, organize resources and competencies, and cultivate intrapreneurial abilities. A single case study elucidates the processes facilitating the conversion of individual-level abilities into organizational intrapreneurial capabilities.

Investigating the impact of over 25 years of entrepreneurial activities on the development of an entrepreneurial university's missions, including education, research, and its third mission, Lundqvist and Williams-Middleton find that these activities have enhanced the university's third mission and positively impacted its education and research missions. This study showcases the evolution of pragmatic and moral legitimacy within the university community and beyond, using qualitative research methods, including longitudinal case study analysis and interviews with faculty and students engaged in entrepreneurial activities.

Challenging assumptions about entrepreneurial success in universities, Henry and Lahikainen examine the intrapreneurial dimensions of their activities. They unveil universities' significant involvement in intrapreneurial pursuits, deepening the understanding of these activities and introducing an analytical framework to emphasize the intrapreneurial university. The research employs an in-depth qualitative approach to investigate the entrepreneurial activities of five universities across multiple countries.

5.2. Unveiling intrapreneurial dynamics in academia

Exploring the experiences of intrapreneurs in the academic context, Engzell, Karabag, and Yström propose an integrative framework to understand organizational and individual-level responses to multiple logics, focusing on intrapreneurial outcomes. They find that universities actively uphold academic logic, identified as a barrier by intrapreneurs, prompting them to refine skills and actively hybridize logics. Intrapreneurs leverage multiple logics, incorporating elements of intrapreneurship, teaching, and research, while universities integrate intrapreneurial logic into their operational processes. This study utilizes qualitative analysis on data from nineteen intrapreneurs across three universities to unveil how these individuals navigate and respond to institutional complexity and multiple logics.

The dynamics of academic intrapreneurship are revealed through two interconnected processes—academic exploration and entrepreneurial exploitation—in the study by De Keyser and Vandenbempt. It highlights how academics navigate four specific logic conflicts, emphasizing the time-dependency of academic intrapreneurship and its paradoxical nature. The findings build on a qualitative case study of a European university.

Exploring researchers assuming the role of intrapreneurs by developing decision support systems from scientific research outputs, Paget, Le Gal, and Goulet investigate individual motivations, organizational barriers, and opportunities within their home institution. They emphasize the pivotal role of individual motivations, which may clash with

Table 2
Future research areas and questions in studying intrapreneurial universities.

Future research areas	Potential research questions
Internal ecosystem: how institutional dynamics shape intrapreneurial activities.	How do institutional dynamics influence the cultivation of intrapreneurial abilities within universities? What are the key factors driving the emergence of intrapreneurial universities? What strategies do universities employ to integrate intrapreneurial logic into their operational processes?
External ecosystem: the external intrapreneurial landscape of universities.	How do external factors, such as regional economic factors, influence the emergence and development of intrapreneurial activities within universities? What are the key strategies employed by universities to engage with external stakeholders, to support and enhance intrapreneurial initiatives? How do external collaborations, facilitated through initiatives like academic incubators and accelerators, contribute to the growth and sustainability of intrapreneurship within universities?
Intrapreneurial pathways: the mechanisms behind evolution of intrapreneurship within university contexts.	How do individual motivations and organizational contexts influence researchers' transition into intrapreneurial roles within academic institutions? What are the key organizational mechanisms and support structures that facilitate the development of intrapreneurial pathways for academics? How do intrapreneurial activities within universities contribute to the creation and dissemination of knowledge, and what are the implications of these activities for their academic career?
Intrapreneurial teaching and learning: how educational practices foster intrapreneurial mindset among students and faculty.	How do intrapreneurial teaching methods influence student engagement and learning outcomes in higher education institutions? What strategies and resources do universities employ to integrate intrapreneurial principles into their teaching curricula and pedagogical approaches? What are the barriers and facilitators that influence the adoption and implementation of intrapreneurial teaching and learning practices within academic settings?
Intrapreneurial impact measures: methods to assess intrapreneurial initiatives' effectiveness in universities.	How do universities measure the societal and economic impact of intrapreneurial activities beyond traditional metrics like job placement or start-up quantity? What are the key indicators and methodologies used by universities to assess the effectiveness of intrapreneurial initiatives within their local and global communities? How do intrapreneurial impact measures contribute to enhancing legitimacy of universities, both within their academic communities and broader societal contexts?

institutional concerns, particularly regarding products beyond the institution's typical expertise. The study utilizes qualitative methods through interviews with researchers, computer engineers, support services staff, and senior-level managers.

Examining universities' roles in social and economic change, particularly through academic social intrapreneurship in the digital

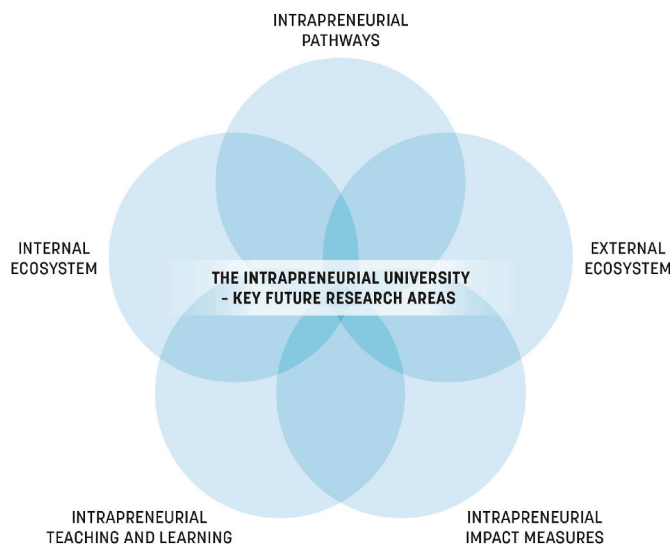


Fig. 1. Future research areas of intrapreneurship in universities.

realm, Nafari, Honig, and Siqueira present a novel model of intrapreneurship within academia. They highlight universities' non-pecuniary contributions to society and emphasize the significance of legitimacy and decentralized innovation. Employing a descriptive case study approach, this research examines the emergence and activities of an international virtual incubator, showcasing the potential of digitally implemented academic social intrapreneurship to address global challenges.

5.3. Advancing intrapreneurship in academia

Aiming to develop a systemic concept of intrapreneurship in academia and empirically test it in neglected areas like graduate employability and wellbeing, Abreu and Grinevich highlight the shift in academia's intrapreneurial ecosystem towards prioritizing graduate outcome quality over traditional metrics like job placement or start-up quantity. The central role of university stakeholder networks in enhancing graduate career satisfaction, start-up creation, and undergraduate employment is emphasized. This study utilizes a combination of administrative and survey panel data from 141 UK higher education institutions.

Navigating internal changes, organizing resources and competencies, and cultivating intrapreneurial abilities are the main focuses of Audretsch, Belitski, and Scarra's research. They find that the financial success of intrapreneurial academic spin-offs is influenced by the adoption of digital technologies, growth stage, and scientific field. The analysis is based on data from 89 academic spin-offs in natural sciences and 660 spin-offs from other scientific fields in the UK between 2015 and 2019.

5.4. Fostering intrapreneurship - insights from academic incubators and accelerators

Examining the role and contributions of an academic incubator in fostering intrapreneurship, Shekhar, Satyanarayana, and Chandrashekar find that incubators could play a pivotal role in driving institutional diversification, nurturing intrapreneurial capabilities, and facilitating organizational learning. This qualitative thematic analysis leverages primary data gathered from 34 interviews, supplemented with secondary data from diverse ecosystem stakeholders.

Focusing on the creation and development of an accelerator, Masucci, Camerani, Corrocher, and Scarlata identify the factors that prompted its founding and guided its setup. They highlight how the

accelerator leverages the university's strengths and resources, and the roles of top management and internal champions in building consensus and negotiating solutions. The findings demonstrate how intrapreneurship within the academy can balance value creation for both the university and its broader ecosystem by strategically managing stakeholder relationships. An in-depth case study approach is used, conducting several interviews with members of the accelerator, key university stakeholders, and external partners.

6. Conclusions, challenges, and future research in university intrapreneurship

This special issue underscores the need for cross-disciplinary comparative research to clarify variations in intrapreneurship within university settings (c.f. Treanor et al., 2021), highlighting differences in intrapreneurship support and organizational dynamics. Examining cultural influences within academic departments adds nuance, enriching our understanding of how organizational traditions impact staff engagement in entrepreneurial activities (Dooley and Kenny, 2015). As shown in Table 2, there are several future research areas and questions in studying intrapreneurial universities, and we have interpreted the suggestions on conclusions, implications, and future research presented by the papers.

The concept of an intrapreneurial university involves fostering entrepreneurial behavior among faculty within the academic realm, facilitating interdisciplinary collaboration to spur innovation, tackle societal issues, and instigate transformative shifts in the university ecosystem, ultimately leading to the development of novel educational approaches and research initiatives, thus making intrapreneurship a fundamental aspect for universities to embrace entrepreneurship.

An intrapreneurial university encourages entrepreneurial behavior among staff within the academic context, all while maintaining affiliation with the institution. It leverages interdisciplinary collaboration to nurture innovation, address societal challenges, and drive transformative change within the university ecosystem. The outcome of 'intrapreneurship' in this context could for example be the creation of a university school curriculum, the establishment of a research center, or the development of innovative teaching methods. Being intrapreneurial should be a prerequisite for a university to become entrepreneurial.

Future research in intrapreneurship within universities encompasses various facets of their internal and external ecosystems, entrepreneurial learning, individual pathways within these environments, and the impact of the intrapreneurial university (see Fig. 1). Internally, scholars aim to unravel how institutional dynamics shape the development of intrapreneurial skills within universities. They are examining the factors driving universities toward adopting intrapreneurial identities and how these institutions navigate internal transformations, despite challenges such as resistance to change, to foster an intrapreneurial culture beneficial to innovation, proactivity, risk-taking, and creativity, as well as taking advantage of the rapid changes in digitalization and AI developments (O'Shea et al., 2007).

Furthermore, researchers explore strategies employed by universities to integrate intrapreneurial thinking into their operational framework and how these strategies impact the experiences of intrapreneurs within academia. Externally, attention shifts toward understanding the broader landscape surrounding university intrapreneurship (Loi and Di Guardo, 2015). Scholars investigate the influence of external factors like industry demands and regional economic conditions on the emergence and evolution of intrapreneurial activities within universities.

Additionally, they scrutinize how universities engage with external stakeholders to support intrapreneurial initiatives, including collaborative efforts through academic incubators and accelerators. The pathways individuals traverse within university contexts are also under scrutiny. Researchers seek to unravel the relationship between

individual motivations, organizational contexts, and the transition of researchers into intrapreneurial roles within academic institutions (Siegel and Leih, 2018; Klofsten et al., 2019).

Moreover, scholars examine the contribution of intrapreneurial activities to knowledge creation and dissemination, along with their impact on academic career paths and institutional strategies. In the realm of intrapreneurial teaching and learning, researchers explore how educational practices foster an intrapreneurial mindset among students and faculty (Fayolle and Gailly, 2015; Blomkvist et al., 2024). They investigate the influence of intrapreneurial teaching methods on student engagement and learning outcomes.

Furthermore, they dissect the strategies and resources utilized by universities to embed intrapreneurial principles into their teaching curricula and pedagogical approaches. Identifying barriers and facilitators shaping the adoption and implementation of intrapreneurial teaching and learning practices within academic settings should also be of interest. Future research in intrapreneurship within universities encompasses various facets of their internal and external ecosystems, as well as individual pathways within these environments. Internally, scholars aim to unravel how institutional dynamics shape the development of intrapreneurial skills within universities. They are examining the factors driving universities toward adopting intrapreneurial identities and how these institutions navigate internal transformations to foster an intrapreneurial culture beneficial to innovation, proactivity, risk-taking, and creativity, while also addressing challenges related to digital integration complexities and the rapid changes in digitalization and AI developments. Future research could also aim to foster conceptual clarity. Intrapreneurial universities are also researched in the context of innovation or entrepreneurial ecosystems. Also, earlier established concepts such as clusters, innovation systems or helix-approaches should be consolidated into an overarching framework. This could also help to find a common language when talking about the role of universities in the world.

Finally, what considerations exist regarding limitations and reservations concerning recommendations to effectively influence future research in the context of intrapreneurial universities? Contextual variability presents a challenge in studying intrapreneurial universities due to significant variations in institutional contexts and external environments across universities and regions. This variability may restrict the generalizability of research findings, necessitating careful consideration of local dynamics and conditions when interpreting results. Additionally, the dynamic nature of technology, marked by rapid digitalization and advancements in AI, brings both challenges and opportunities for research. Continuous adaptation of research frameworks and methodologies is crucial to keeping abreast of technological developments and their implications for intrapreneurial practices within universities. Moreover, ensuring conceptual clarity is essential in this field. Intrapreneurial universities intersect with complex concepts such as innovation ecosystems and entrepreneurial environments, often leading to conceptual ambiguity that requires resolution. Developing a unified framework can facilitate consistent research approaches and interpretations, thereby strengthening the robustness and applicability of findings across diverse academic settings.

CRedit authorship contribution statement

Magnus Klofsten: Writing – review & editing, Writing – original draft, Visualization, Supervision, Project administration, Conceptualization. **Alexander Brem:** Writing – review & editing, Writing – original draft, Conceptualization. **Maribel Guerrero:** Writing – review & editing, Writing – original draft, Conceptualization. **David Urbano:** Writing – review & editing, Writing – original draft, Conceptualization.

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