International Journal of Advances in Engineering and Management (IJAEM)
Volume 8, Issue 2 Feb. 2026, pp: 409-411 www.ijaem.net ISSN: 2395-5252

Entrepreneurship in Medical Engineering Equipment in Regional Sciences Economy: A Review with Reference to Attrition Entrepreneurship Theory

Mirmohammad Seyednouri[1], Mehdi Farzpourmachiani[2], Mehrdad Fojlaley[3], Snjezana Baroness Rajacic[4]

[1]*Member of the Club of Innovative Minds of the European Academy of Sciences, Postdoctoral in Entrepreneurship, Technofest Institute of Technology University (TITU), Erquelinnes, Belgium*
[2]*Academician of the European Academy of Sciences, Associate Professor in entrepreneurship, department of entrepreneurship, Technofest Institute of Technology University (TITU), Erquelinnes, Belgium*
[3]*Academician of the European Academy of Sciences, Professor in entrepreneurship, department of entrepreneurship, Technofest Institute of Technology University (TITU), Erquelinnes, Belgium*
[4]*Academician & President of the European Academy of Sciences, Professor in entrepreneurship, department of entrepreneurship, Technofest Institute of Technology University (TITU), Erquelinnes, Belgium*

Date of Submission: 15-02-2026 Date of Acceptance: 28-02-2026

Abstract
Medical engineering equipment entrepreneurship is an essential component of the regional economic development process. This review integrates the main concepts of medical technology entrepreneurship, its regional economic significance, and theoretical frameworks that explain the differences in entrepreneurial outcomes and attrition. With the rapid technological advancements and demographic changes in healthcare systems, medical engineering equipment entrepreneurship, including devices, diagnostics, and health technologies, is situated at the nexus of innovation ecosystems and economic development. We discuss the challenges and opportunities associated with medical engineering equipment entrepreneurship, focusing on innovation adoption, mechanisms of support in innovation ecosystems, and regional competitive advantages, based on recent studies of technology entrepreneurship and healthcare innovation. Additionally, we introduce the notion of attrition in entrepreneurial processes, which is derived from other theories, such as attraction-selection-attrition and push-pull models, to explain why many entrepreneurial ventures fail to survive despite being in a supportive environment. Awareness of attrition dynamics improves our understanding of the selective pressures involved in medical engineering entrepreneurship and provides insights into policy interventions that could potentially increase survival and growth rates. Finally, we discuss the implications of our findings for economy models of regional sciences and propose avenues for future studies.

I. Introduction

Health technology and medical engineering equipment entrepreneurship has emerged as a prominent area as an essential part of innovation infrastructure and regional economic development. “Medical engineering equipment” refers to a wide array of technologies, such as diagnostic and therapeutic equipment, wearable sensors, and digital health platforms, which are characterized by rigorous regulation, investment, and market risks. In the context of growing healthcare needs and technological development, entrepreneurship in this area has far-reaching implications for economic development, employment, and social welfare.

Although the majority of the literature on entrepreneurship has concentrated on the creation of ventures and opportunities, there has been relatively little attention devoted to understanding why some ventures survive and others withdraw from the market, particularly in high-tech areas such as medical engineering equipment. In this review, we synthesize knowledge from the literature on technological entrepreneurship in healthcare, innovation clusters, and conceptual theories related to attrition in entrepreneurship processes.

Defining Entrepreneurship in Medical Engineering Equipment

Medical engineering entrepreneurship is distinct from other types of entrepreneurship because it is involved in both technological innovation and clinical relevance. According to researchers, the definition of technology entrepreneurship in the healthcare industry is “the process of creating, launching, and growing

International Journal of Advances in Engineering and Management (IJAEM)
Volume 8, Issue 2 Feb. 2026, pp: 409-411 www.ijaem.net ISSN: 2395-5252

businesses that develop new technologies, products, and services to create value for patients and other stakeholders." This includes traditional medical devices, as well as software and digital health solutions that can be used for diagnosis, treatment, and patient engagement.

The empirical literature indicates that these activities are conducted in a multi-stakeholder environment that includes patients, healthcare professionals, regulatory bodies, and payers, making both product development and commercialization more challenging. The issue of clinical value, regulatory acceptability, and market fragmentation is a significant barrier to entrepreneurship.

Entrepreneurship and Regional Economic Development

The relevance of entrepreneurship in economics not only pertains to the functioning of individual firms but also to the evolution of industries from a regional perspective. Regional sciences scholars highlight that the impact of entrepreneurial firms on the evolution of regional industries occurs through the process of innovation, knowledge spillovers, and competition. This is grounded in Schumpeterian logic, where entrepreneurs act as innovators and agents of creative destruction, generating Schumpeterian rents that propel regional development.

In the context of regional innovation clusters, the significance of entrepreneurial firms in the area of medical engineering can foster specialization and the evolution of related industries. For example, regional policies such as the Canadian CAN Health Network illustrate how a joint ecosystem strategy, integrating healthcare organizations with entrepreneurial firms, can enable the commercialization of medical innovations and ensure access to global markets.

Challenges and Opportunities

However, the following are some of the challenges that medical engineering equipment faces in terms of entrepreneurship:

The healthcare industry is highly regulated, and any equipment or technology that is to be used in the industry has to meet strict standards of efficacy and safety. This makes it difficult for new entrants, especially those that are entrepreneurial in nature, to enter the industry.

Technologies that are new may require changes in the behavior of users, including patients and healthcare professionals. This makes it difficult for the technology to gain widespread acceptance in the market, which is a challenge that technology entrepreneurship faces.

Financing is also a challenge for medical engineering equipment that is entrepreneurial in nature. Such equipment may take a long time to develop and may require specialized capital.

Attrition in Entrepreneurial Processes: Theoretical Perspectives

Entrepreneurial attrition, or the loss of ventures or participants in the entrepreneurial system over time, can be explained using a number of conceptual frameworks:

Although developed in organizational theory to explain workforce trends, a similar framework can be applied to entrepreneurial ecosystems: firms that are unable to adapt to environmental pressures (such as market requirements or capital availability) are more likely to remove themselves from the regional economy.

Academic research on entrepreneurship has demonstrated that entrepreneurial intention is the result of push factors (such as job dissatisfaction) and pull factors (such as entrepreneurial opportunity recognition) coming together to form the impetus for new business formation. In regions where pull factors are absent or environmental conditions are difficult; rates of entrepreneurial attrition may be higher.

Although these theories have not been commonly referred to as "Attrition Entrepreneurship Theory" in formal literature, the concept of entrepreneurial ventures undergoing attrition at various points in the entrepreneurial process, from formation through to growth, provides a valuable framework. Attrition may occur due to rejection, resource unavailability, or failure to provide clinical value, and provides insight into the entrepreneurial landscape of med-tech ventures.

Entrepreneurial Ecosystems and Regional Sciences Economy

Regional economic frameworks highlight the significance of clusters, networks, and competitive advantage in maintaining entrepreneurial activities. Based on the literature of regional competitive advantage, entrepreneurs need to capitalize on the regional attributes of innovation ecosystems, including universities, research institutes, and industry networks, to translate innovation into economic growth.

Medical engineering entrepreneurship can greatly benefit from innovation ecosystem attributes, which can mitigate uncertainty by means of knowledge spillovers, mentorship networks, and mechanisms to connect with local healthcare demand. The OECD study of innovation clusters highlights the significance of networking in speeding up the

commercialization process and improving global competitiveness of health technology companies.

Policy Implications and Ecosystem Support

To promote entrepreneurship in medical engineering equipment in regional economies, policy frameworks can focus on the following:

Innovation procurement and public support structures that enable startups to co-develop and test solutions with healthcare providers.

Financial incentives and access to capital for high-risk, long-horizon investments, which are common in med-tech startups.

Learning and research infrastructure that supports translational research and entrepreneurial capacity-building among clinicians and engineers.

Furthermore, understanding the dynamics of attrition implies that assistance should not only focus on startup formation but also on survival assistance, market validation grants, and ecosystem matchmaking to mitigate early-stage startup exit.

II. Conclusion and Future Research

Medical engineering equipment entrepreneurship is a constantly evolving area that has far-reaching significance for regional economic development. The integration of technology entrepreneurship and regional sciences perspectives draws attention to the opportunities that innovation-driven ventures offer and the challenges that they are confronted with.

Although entrepreneurial attrition is not a recognized theory, the application of its principles to make sense of the selective pressures that entrepreneurial ecosystems exert is an important addition to our understanding of why some med-tech ventures succeed while others fail. Future studies should examine the attrition process in medical engineering entrepreneurship.

References

[1]. Beaulieu, M., Lehoux, P. Emerging health technology firms' strategies and their impact on economic and healthcare system actors: a qualitative study. J InnovEntrep 7, 11 (2018). https://doi.org/10.1186/s13731-018-0092-5

[2]. Farzpourmachiani, M., &Farzpourmachiani, A. (2024). Attrition entrepreneurship theory. Tubittum, 80, 28. https://www.tubittum.com

[3]. Kulkov, I., Ivanova-Gongne, M., Bertello, A., Makkonen, H., Kulkova, J., Rohrbeck, R., & Ferraris, A. (2023). Technology entrepreneurship in healthcare: Challenges and opportunities for value creation. Journal of Innovation & Knowledge, 8(2), Article 100365. https://doi.org/10.1016/j.jik.2023.100365

[4]. Long, Z., Zhao, G., Wang, J., Zhang, M., Zhou, S., Zhang, L., & Huang, Z. (2021). Research on the Drivers of Entrepreneurship Education Performance of Medical Students in the Digital Age. Frontiers in psychology, 12, 733301. https://doi.org/10.3389/fpsyg.2021.733301

[5]. Organization for Economic Co-operation and Development (OECD). (2021). Entrepreneurship in regional innovation clusters: Case study of Chiang Mai and Chiang Rai, Thailand (OECD Studies on SMEs and Entrepreneurship). OECD Publishing. https://doi.org/10.1787/2a24a552-en

[6]. Schumpeterian rent. (n.d.). In Wikipedia. Retrieved from https://en.wikipedia.org/wiki/Schumpeterian_rent

[7]. Rypestøl, J.O. Regional industrial path development: The role of new entrepreneurial firms. J InnovEntrep 6, 3 (2017). https://doi.org/10.1186/s13731-017-0064-1

[8]. Tunalioglu, M.N., Karatas-Ozkan, M., Costanzo, L.A. et al. Extending the boundaries of academic entrepreneurship: demonstrating the instrumentality of new logics for addressing social inclusion. J Technol Transf 49, 1822–1845 (2024). https://doi.org/10.1007/s10961-023-10059-1

[9]. Yu, Z., & Lu, K. (2023). What motivates academics toward entrepreneurship? Examining the formation of academic entrepreneurial intention from the push-pull perspective. Frontiers in psychology, 14, 1073866. https://doi.org/10.3389/fpsyg.2023.1073866