Chapter 11
Concluding Remarks

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11.1 Conclusions

The book entitled *Re-building University Capabilities: A Public Policy and Managerial view Applied to Innovation and Technology* aims to, in five parts and 10 chapters debate, comprehend, and exchange views on how policies and practice frameworks related to science, innovation, and technology have influenced and rebuilt numerous universities' capabilities. This book sheds light on this topic by highlighting the challenges faced by universities seeking to become more entrepreneurial and the moves made by policymakers striving to cultivate environments in which entrepreneurial attitudes and behaviors are competently designed, developed, and supported.

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11.1.1 Public Policy and Managerial View

Many public policy reforms have occurred in the higher education sector over the last few decades due to reduced resources, stakeholder pressure, educational trends, and socio-economical changes.

Chapter 1 of the book explores how public policies have radically altered the ways in which universities are organized and modified from the inside. Universities and their governance structures should strive to transform into entrepreneurial ambidextrous organizations in response to pressure from stakeholders and higher education public policies. Looking ahead, the three gaps that business and university stakeholders identify pertain to issues related to higher education public policy objectives. Universities must work to improve gender and ethnic diversity, close gaps in employment opportunities, and focus on mental health awareness. Colleges should be equipped with a variety of technical abilities, including those related to artificial intelligence, hybrid learning environments, and other technical capabilities that fill gaps in the curriculum. With governance trends in mind, universities should adapt their fundraising strategies in light of their significant reliance on public money and the rising demand for alternative funding sources. Consequently, the governance, missions, and outcomes of the organization should encompass a variety of competencies.

A thorough analysis of the ways in which university capabilities are rebuilt across higher education systems should be performed, as geographic contexts and time are both critical elements. Chapter 2 identifies the reasons why the theoretical and empirical work published in this field of study requires further research. It also provides examples of the ways in which university capacities in various geographic locations have been rebuilt. It is also important that we understand the competitive pressures that university administrators must contend with when deciding which specific or supplementary university capabilities they should fund. The remainder of the book discusses how to rebuild the four university capabilities (entrepreneurial, innovative, digital, and sustainable capabilities) using both theoretical and empirical methods. University managers require specific capabilities to support each stage of a university's transformation. These capabilities require further examination. This book outlines how university managers and leaders have developed specific capabilities to successfully address university transitions (entrepreneurial, innovative, technological, and sustainable). Trends evident in the higher education industry are also discussed, along with the roles that university administrators need to play to realize them.

11.1.2 University Entrepreneurial Capabilities

Due to their significant contribution to regional economic growth, universities have received sufficient attention in academic literature on entrepreneurship. This is because of their organizational qualities, which enable them to be both producers of ideas and promoters of the kind of entrepreneurial thinking that makes it possible to start new businesses. Scholarly literature, however, still needs to be more thorough when outlining how contextual factors and stakeholders influence university capabilities, allowing them to generate and manage entrepreneurial initiatives, despite the abundance of studies that address the relationship between universities and entrepreneurship. Because of this, this book posits that entrepreneurial qualities, such as constructing, capturing, linking, and integrating, are all affected by the university's stakeholders and its context. These conclusions are drawn from a comprehensive evaluation of 152 publications published between 2000 and 2022. We demonstrate cause-and-effect links between works of literature on entrepreneurship, universities, and entrepreneurial capacities, supporting our claim using logical, inductive, and abductive reasoning.

This book seeks to assess how stakeholders and contexts affect a university's ability to develop and manage entrepreneurial ventures, while simultaneously addressing other academic discussions on entrepreneurship and innovation. To do this, we have identified four key entrepreneurial competencies that universities incorporate into such processes. Consequently, based on the findings of our systematic literature analysis, we can make the following two conclusions. The first conclusion relates to how contexts and stakeholders affect a university's entrepreneurial capacity. Chapter 3's findings established what universities should do to take advantage of their entrepreneurial capacity. The chapter identifies four entrepreneurial competencies—capturing, connecting, building, and integrating—that enable universities to create and oversee entrepreneurial activities, based on our thorough literature study. Understanding these competencies is vital, as they reveal how entrepreneurial traits can be acquired, changed, and adapted to respond to the demands and opportunities of contexts and stakeholders. However, it is worth noting that universities were not designed to be factories for entrepreneurship. Therefore, examining universities in light of the four suggested capabilities could provide insights into how they use knowledge to launch businesses that aid social and economic advancement.

Using the dynamic capabilities approach, the exploratory research in Chap. 4 sought to fill in the knowledge gap with regard to our understanding of how entrepreneurial talents are imbued within organizations. We have studied how these entrepreneurial qualities are formed and how they evolve, as well as whether contexts and stakeholders significantly impact upon this evolution. Two conclusions can be drawn based on the data analyzed for Belgium, Colombia, Ecuador, and Uganda. We initially conclude that stakeholders and contexts impact upon universities' entrepreneurial potential. According to prior research in this area, socioeconomic and cultural backgrounds affect how individuals and organizations who

exhibit entrepreneurial behavior feel about themselves. Universities use their dynamic capabilities to gather and analyze contextual data, resulting in opportunities that are then taken advantage of using entrepreneurial capital (which is available within the organization). Our findings are consistent with existing scholarly literature. We enhance that organizational-level factors facilitate a better understanding of national and regional policies. These policies can be viewed as opportunities to take advantage of commercial entrepreneurship (such as the Bayh–Dole Act and similar policies) and social entrepreneurship (such as the Sustainable Development Goals). Our research demonstrates how contexts and policies impact entrepreneurial orientation on a personal level, whereby people identify business possibilities through matchmaking and pursue these goals through commercial entrepreneurship pathways—just as social ventures formed in university settings are partially influenced by the social challenges of the setting, which has also been demonstrated in previous studies. The second result discussed in Chap. 4 relates to advancing entrepreneurship capabilities in higher education. According to our findings, entrepreneurial capital development often reflects the effects of dynamic capacities. As a result, our findings also demonstrate that the availability of such entrepreneurial capital determines a university's capacity for entrepreneurship. The results of this chapter are consistent with prior academic research on entrepreneurship and innovation, which shows that dynamically capable firms are more competitive because they are better able to adjust to develop their competitive nature.

11.1.3 University Innovation Capabilities

Chapter 5 stressed the importance of university innovation capabilities in meeting the expectations of various stakeholders, especially for trained workers who are able to handle the difficulties of a changing world, new technological advancements, and strengthened national innovation agendas. The chapter's key finding is that organizations with an entrepreneurial focus are more likely to develop into regional innovation builders that can construct bridges between organizations to ensure equity, inclusivity, and sustainability. Taking advantage of existing university capabilities when sensing, seizing, and transforming new innovative and technological opportunities that achieve public policy agendas could theoretically allow researchers to experiment with a complementary or substitution effect.

Chapter 6 examines the European Union. The European Union seeks to support the university innovation ecosystem through many projects, organizations, and public agendas. However, these goals are not free from obstacles and problems. In this chapter, we examine the European Union as a region that has created programs to allow cooperating countries, universities, and public–private organizations to build their innovation capabilities. We offer information on the landscape of university innovation capabilities using data from the European University Association, the European Commission, and Eurostat. The findings indicate that finance is one of the major filters or barriers preventing new capabilities, solutions, and research. These

results also point to issues with inclusivity and sustainability concerning universities' capacity for innovation. The chapter also offers fascinating insights into the public policy and management strategies used by governments within the European Union to support universities' sustainable innovation capabilities.

11.1.4 University Digital Capabilities

Chapter 7 discusses how digital technologies are changing every aspect of society, including work environments and the contexts of education and learning. The university has taken the lead in this process, enabling people to function in a digital society by providing digital capabilities training. Digital innovation management has become a topic of particular interest for companies, along with the rise of the digital entrepreneurial ecosystem, which is rooted in the concepts of the entrepreneurial economy, national entrepreneurship systems, and entrepreneurial ecosystems connected with universities. The fundamental finding of this chapter is that technical advancements, instructional tools, digital platforms, and devices have all contributed to digital capabilities through university operations. The chapter identifies several issues with digital sustainability, inclusivity, and self-management that universities, higher education systems, and organizations that certify higher education must seek to better comprehend. The development of universities' digital capabilities has also been expedited by the evolution of digital platforms that have supported universities' entrepreneurial ecosystems, particularly during the COVID-19 pandemic.

Chapter 8 offers insights into how universities can help professionals to develop their digital capabilities by creating policy frameworks to improve digital capabilities through higher education. The advancement of business and society is fundamentally dependent on digital capabilities. At the moment, the job market needs people with digital capabilities. Because of this, it is vital that we fully understand how people develop digital capabilities in response to higher pay and employment opportunities. This chapter examines the digital capabilities of the university, establishing how people in Latin America and the Caribbean (LAC) acquire them. We compare the digital capacities of LAC economies to those of European economies, and our investigation demonstrates the environmental factors in these economies that support digital capabilities (e.g., broadband subscriptions, internet access, and socioeconomic conditions).

11.1.5 University Sustainability Capabilities

Over the past 10 years, university stakeholders have become increasingly interested in sustainability capabilities, and universities have made significant efforts to integrate a sustainability perspective into all aspects of their operations. Scholarly

literature published between 2010 and 2022 is examined in Chap. 9 to better outline the development of research on sustainable capabilities inside organizations. Our findings show that universities are actively moving away from "the unsustainable model" and toward "the sustainable model." Our analysis of the literature's content reveals trends connected to the influence of university stakeholders on the development of sustainable capacities within universities through partnerships and the curriculum. Chapter 9 also highlights a number of consequences related to universities' contributions to frameworks for sustainable public policies.

External demands relating to major societal concerns and the United Nations Sustainable Development Goals have impacted upon the development of universities' sustainability capacities. This study examines the sustainable transition in North American and European universities, because information on these universities is readily available. Our analysis provides insights into universities' sustainable transformation trends and key performance indicators, using data from the European University Association and the Sustainable Campus Index. The initial findings presented in Chap. 10 reveal how university administrators have encouraged a sustainable strategy by creating new university capabilities.

11.2 Final Remarks

This book seeks to provide new insights into established frameworks, tracing how joint research between universities, firms, and public policy instruments can have both direct and indirect effects on the involved firms' innovativeness. This conceptualization is determined by commercialization, results arising from the direct innovative effects of university collaboration and university/academic engagement (through technology transfer, social engagement, scholarly impacts), constituting the "third university mission" (Dábic et al., 2022). Consequently, it amplifies firms' inner abilities, thereby indirectly increasing innovativeness. Although most firms consider research and development (R&D) investment to be closely connected with existing products and services, for scientific policies, the state finances are fundamental as long-term research, which applies to many diverse actors, and thus has a considerable impact on the economy (Audretsch et al., 2022). In contrast, innovation policies are often defined quite broadly, for example, as the integral of all state initiatives regarding science, education, research, technology policy and industrial modernization, overlapping also with industrial, environmental, labor, and social policies (Kuhlmann, 2001, p. 954). As a result, cooperative research has shown that innovation capabilities increase in line with network expansion.

All theories stress the significance of entrepreneurial opportunity discoveries and the pursuit of business innovation when it comes to competitiveness and economic growth. This new paradigm of entrepreneurship-based digital innovation complements and replaces the "technology-push" type of innovation, translating scientific knowledge and research advances into commercial applications. However, how entrepreneurs develop, transfer, adopt, use, evolve, change, or create new digital

technologies within networks and cooperate with universities (supported through European Commission financed projects and different science policies), has been under-investigated. A limitation of the entrepreneurial ecosystem framework, as emphasized by Song (2019, p. 571), is that until recently, there has been little discussion of technological advancements in general and digitization in particular. The question we sought to address in this book concerned the role of universities in rebuilding digital technologies for entrepreneurship, benchmarking the digital capabilities of LAC and European economies to support entrepreneurs to foster digital innovation.

The book sets out how university cooperation and science, innovation, and technology policies have all evolved as a result of the rapidly changing environment for R&D influenced by the rise of the digital economy, Industry 4.0 (Dabić et al., 2016), and external disruptions such as the COVID-19 pandemic (Guerrero & Pugh, 2022). It is important that we thoroughly analyze the rebuilding of university capabilities across higher education systems, as geographic contexts and time are both critical elements (see Crow & Dabars, 2015; Teece, 2023). Reviewing the body of theoretical and empirical work published in this field of study is crucial, as it provides examples of how universities have rebuilt their capacities in various geographic situations. Analysis of this work is also instrumental in comprehending the competitive pressures that university administrators must contend with when deciding which specific or additional university capabilities to fund. A key message that this book strives to communicate is that the main outcome of innovation policies ought to be to emphasize and highlight the challenges fronted by universities in becoming more entrepreneurial, innovative, digital, and sustainable. Policymakers should work to create sustainable environments in which entrepreneurial attitudes and behaviors can be competently designed, developed, and supported.

We must admit that we are fully aware of our limitations and the possible future topics requiring further analysis in this area. We therefore sincerely welcome all readers and all those currently working in this field to share their thoughts and comments. We would like to thank all those involved—either directly or indirectly—in the publication of this book. It is only by introducing best policies, sharing examples that support universities' future development, and taking on joint work to prepare business owners, managers, and students for the realities they will face that we can strengthen the university's university mission.

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