

# Entrepreneurial University and Social Innovation Ecosystems: Do They Support HEIs' Knowledge-Based Economic Development?



Nibedita Saha, Tomáš Sáha, and Petr Sáha

**Abstract** This chapter intends to analyze and develop the concept of the entrepreneurial university and social innovation ecosystem from multiple viewpoints, including HEI regional knowledge spillover and social innovation ecosystem theoretical approaches, as well as policy and research views. The emerging perspectives of the entrepreneurial universities in the knowledge economy are considered as an instrument for “innovation and development” that acts as an elixir for the social innovation paradigm. Due to its vital position in the horizon EU strategy, respectively entrepreneurial universities and the social innovation ecosystem are gaining increasing importance in the EU’s regional knowledge-based economic growth policy discourse. Since then, they’ve been used by policymakers around the world as building blocks for executing various innovation policies, including research and innovation, smart inclusive regional knowledge growth, social innovation, industrial development, and regional development policies. The responsiveness of entrepreneurial universities and the social innovation ecosystem is envisioned in this chapter as a “facilitator” for increasing knowledge-based economic development and innovation-driven regional growth.

**Keywords** Entrepreneurial university · Higher education institution (HEI) knowledge-based growth · Quadruple helix · Social innovation · Triple helix

---

N. Saha (✉) · T. Sáha

Footwear Research Centre, University Institute, Tomas Bata University in Zlín, Zlín, Czech Republic

e-mail: [nibedita@utb.cz](mailto:nibedita@utb.cz)

P. Sáha

Footwear Research Centre, University Institute, Tomas Bata University in Zlín, Zlín, Czech Republic

Centre of Polymer Systems, Tomas Bata University in Zlin, Zlín, Czech Republic

© The Author(s) 2023

R. Adams et al. (eds.), *Artificiality and Sustainability in Entrepreneurship*, FGF Studies in Small Business and Entrepreneurship,

[https://doi.org/10.1007/978-3-031-11371-0\\_10](https://doi.org/10.1007/978-3-031-11371-0_10)

## 1 Introduction

The conception and significance of entrepreneurial universities' emerging perspectives in the knowledge economy especially the transformations or reforms of universities have been inclusive with the impact of social innovation ecosystems and sustainability of entrepreneurial universities (Cai and Ahmad, 2021). Today, local, provincial, and national higher education institutions (HEIs) face an uncertain and complex situation caused by globalization, economic distress, as well as social and environmental challenges. In this regard, the role of entrepreneurial universities in economic development, i.e., *knowledge-based and innovative economic development*, i.e., *social innovation*, has become a key subject in academia, business, management, research and development, and policymaker's debates regarding the cap potential to decorate local know-how spillover and innovativeness to generate prosperity and marketability (Heaton et al., 2019). Similarly, entrepreneurial universities' knowledge development process, especially in convergence regions, faces growing difficulties. Nevertheless, inside the regions, the present know-how spillover has encouraged other regions also in order to create innovative knowledge of cross-disciplinary studies that facilitate SMEs and HEIs to compete with the commercial enterprises and socioeconomic challenges (Morawska-Jancelewicz, 2021). Given such trends, the corona pandemics of our time are offering the most recent examples of how a global market and knowledge society are gaining experience in handling the global emergency. For example, entrepreneurship also can offer a wider range of options, as well as speed and agility, to a world that is adapting to the impacts of COVID-19 (Ratten and Jones, 2021).

Although there are some ambiguities in the activities of entrepreneurial universities that need to be addressed, it implicates the facilitating characteristics of entrepreneurial university's knowledge-driven behavior. This chapter aims to identify gaps and consider the understanding of the *entrepreneurial university's strategy and social innovation ecosystem as an integrated approach: HEIs' regional knowledge spillover and social innovation ecosystems* theoretical approach along with the policy and research perspectives. Both the approaches attain significant eminence in the Horizon Europe strategy, *through the policymakers and researchers* nationally and across the world for enforcing smart inclusive local growth, social innovation business, and local policies. Consequently, the significance of HEIs such as entrepreneurial universities emerges gradually recognizing its importance. As, they can perform an important role by engaging themselves with the broader stakeholder community to overcome the outstanding challenges of the modern era.

Accordingly, researchers Cruz et al. (2021); Pugh (2020); Carayannis and Campbell (2010); and Kamran et al. (2021) stated that a successful academic entrepreneurship ecosystem automatically leads to the emergence of business ecosystems with consequent societal and regional advantages. Additionally, Sperrer et al. (2016) emphasized that the "entrepreneurial university" concept is nowadays speculated a critical function in promoting self-improvement and innovation that facilitates overcoming the challenges of highly turbulent and unpredictable markets. In the

context of entrepreneurial universities' key role, Guerrero and Urbano (2010) mentioned that the entrepreneurial university concept particularly addresses the notion of knowledge-based entrepreneurship that appears as a crucial driving force. According to their understanding, it acts as a knowledge producer as well as a knowledge disseminator – to enhance economic growth, create employment opportunities, and initiate competitiveness as a whole. Consequently, it is necessary to highlight that entrepreneurial universities' interrelations with environmental and internal factors play a crucial role in fulfilling entrepreneurial missions (teaching activities, R & D activities) and knowledge-based economic development (Clark, 1998; Sporn, 2001; Etzkowitz, 2004; Kirby, 2004, 2006; Guerrero & Urbano, 2012).

On the other hand, concerning entrepreneurial universities' impact on regional knowledge-based economic development, Etzkowitz and Klofsten (2005) emphasized that nowadays entrepreneurial universities' role in regional knowledge spill-over is perceived as different technological and social dynamics, in particular, centered on exceptional technological advances which have created some extraordinary opportunities. Simultaneously, from the regional innovation policy perspective point of view, the conception of an entrepreneurial university is a “bottom-up” approach of different actors (such as business, government, and academics) collective initiatives, i.e., the formation of the “triple helix” concept to facilitate regional knowledge-based economic growth. Furthermore, it is necessary to mention that the significance of social innovation along with the HEI's knowledge-based economic development cannot be ignored, since the social innovation ecosystem creates a strong synergy between the economic and natural science innovation process that strengthens the connection to resolve the social problems (Balaton et al., 2016).

While addressing the institutional knowledge development process and social innovation process, Moulaert and Nussbaumer (2005a, 2005b); Moulaert et al. (2007); Carayannis and Campbell (2006); Carayannis and Alexander (2006); Urbano and Guerrero (2013); and Ferreira et al. (2018) underlined that in modern day, the impression of regional social innovation gadget and entrepreneurial university's knowledge development strategy escalates HEIs' innovation-driven regional growth. Respectively, Hannon (2013) stated that an entrepreneurial university's operational approach acts as a promoter of innovation and knowledge-oriented societal growth. Again, Carayannis and von Zedtwitz (2005) also said the entrepreneurial university would connect entrepreneurs from local, regional, and global levels. From the growing importance of the social innovation system point of view, Morawska-Jancelewicz (2021) demonstrated the new significant activities of entrepreneurial universities encouraging social innovations (i.e., the quadruple helix perception) especially emphasizing the regional knowledge-based economic development system. In addition, taking the initiative within the advent of social well-being creates an effect in the best of life and allows the co-advent of understanding within the framework of public-nonpublic partnerships.

*As Joanna Morawska-Jancelewicz mentioned (Morawska-Jancelewicz, 2021, p. 3), In this new paradigm, the importance of knowledge is not determined exclusively by competitiveness and productivity, but by taking into account the creation of social well-being, the impact on the quality of life and co-creation of knowledge as part of public-private*

*partnerships. The existence of a well-developed network in a given territory makes it possible to combine and strengthen the actions of all entities (actors), which influences, as a result, the acquisition of a collective skill conducive to innovation processes.*

This indicates an additional distinctive trait of entrepreneurial universities that enable social innovation ecosystems to improve the existing knowledge of higher education institutions and contribute to the knowledge economy. Enduring with this debated topic, the authors intended to exemplify a unique purposeful framework that considers entrepreneurial universities' knowledge-based economic growth as well as socially valued network relations and regional developments. Correspondingly as a way to fill the space of noticeably few research on entrepreneurial universities and social innovation ecosystems help on HEIs' knowledge-primarily based totally economic development, this chapter intends to show the accessibility and benefits of entrepreneurial universities' (EU) significant activities initiating innovation-pushed regional development. In consequence, the work of Daniel et al. (2020) shows in what way the entrepreneurial universities taking initiatives in regional economic development that fostering the entrepreneurial mindset among higher educational institutions within the local communities and companies. Furthermore, Saha et al. (2020a, 2020b) also highlighted that entrepreneurial universities act as a great facilitator for provincial socioeconomic growth, because of the spin-off of new, progressive tasks that enhances value through know-how advent and entrepreneurial discovery process (EDP). From the HEIs' supportive *mechanism factor of view, entrepreneurial universities play an important function in sustainable local and financial development: figuring out the considerable advantages in affiliation with the social innovation process; permitting the important elements that encourage social innovation and social entrepreneurship development process; and supporting the positive flows of information to create unique tacit knowledge that supports regional knowledge spillovers to enhance sustainable entrepreneurial ecosystems.*

Following these abovementioned benefits of entrepreneurial universities, it is essential to mention that in recent times, entrepreneurial university acts as an important facilitator in changing the perception for supporting HEIs that has put more emphasis on "entrepreneurial university" as a "third mission" conception (Saha et al., 2020a, 2020b; Saha and Saha 2020c). This impression enables to develop a conceptual framework for combining both the insights of entrepreneurial universities operational approach and social innovation ecosystems that fascinate one of the prominent activities of the HEIs that empower to explore the future prospect and integrate the global society effectively. Hence, the comprehensive aim of this observation is to decide whether or not there are institutions among the stages of improvement of entrepreneurial university and social innovation ecosystems that are connected with the supportive facility of HEIs' knowledge-based economic development and enhancement of further regional economic development. In addition, *the theoretical contribution* of this chapter's subject matter is primarily based on evolutionary areas and the strategic role of entrepreneurial university and social innovation ecosystems which encompasses significant areas of regional knowledge-based economic development. On the other hand, the *practical contribution* of this

chapter brings about elevating cognizance approximately the present-day possibility of entrepreneurial universities withinside the context of triple helix, quadruple helix, and inclusive knowledge-based economic growth and transformation of HEIs' right into a regional, revolutionary, and entrepreneurial university. The findings of this study may be used as suggestions for local organizations who are in search of boom universities' contributions to understanding primarily based totally financial system with the emergence of social progressive procedure that foster social entrepreneurship.

To illustrate the content of this study, this chapter consists of six additional sections. The first section focused on identifying the theoretical framework of the premeditated role of entrepreneurial universities, by facilitating the knowledge-based economic development strategy of higher education institutions. Section two summarizes entrepreneurial university's contributions and influence in social innovation along with the subsection of social innovation ecosystems and knowledge-based economic development. Subsection three discusses the role of entrepreneurial universities as agents of the knowledge economy, as well as the strategic impacts of entrepreneurial universities on knowledge development and competitiveness. Consequently, this section four expands the discussion by addressing challenges related to the strategic role of the entrepreneurial university and the combined social innovation strategies that support the dissemination of HEIs' knowledge and enhance socioeconomic development. Later, section five presented solutions and recommendations with respect to issues, influences, and challenges. Finally, section six the last part deals with the recommendation and conclusion. Furthermore, as a result of the entrepreneurial university and social innovation ecosystems' combined effort to support HEIs' knowledge-based economic development that continues to move forward for regional economic development, this section highlights the need for more detailed studies on the said topic, which is carried onward by the chapter.

## **2 Theoretical Background of the Entrepreneurial University and Social Innovation Ecosystem**

The theoretical context of the "entrepreneurial university" notion and rising attitude of the social innovation ecosystem determines that in the era of modernization and industrialization, both entrepreneurial university and social innovation ecosystem are viewed as sources of regional knowledge-based economic development. Thus, entrepreneurial university conception has increasingly been recognized as a leading perception of knowledge spillover, socioeconomic development, and regional competence development. On the other hand, entrepreneurial universities can perform a crucial educational role to facilitate the discussion on the way of entrepreneurship development. Relating to this conception, Jami and Gökdeniz (2020) also mentioned that entrepreneurial universities can act as a well-defined and implicit process where universities can also help new businesses (start-up) to build innovative business

models, put systems in place, and train human capital, i.e., human resources to professionally meet their business needs.

In order to examine the impact of entrepreneurial universities on HEIs, some major aspects that support entrepreneurial universities' top-down leadership strategies and policies on HEIs' knowledge-based economic development have been proposed by Bezanilla et al. (2020); Audretsch et al. (2012); Lehmann et al. (2020); and Pinheiro et al. (2015), for example, empowering and encouraging academic entrepreneurship; developing an entrepreneurial culture, attitudes, and aptitudes within institutions that will play a key role in creating and promoting regional economic growth and competitiveness; and generating their own funding capability and establishing their own technology transfer offices and incubators.

Conferring this Kirby (2004, 2006) indicated that entrepreneurial universities' role as a knowledge development process acts like a driving force that reflects individuals' skills and creativity and generates willpower to achieve it. Cosequently, it is necessary to underline that the entrepreneurial university concept or approach is not a groundbreaking concept, since it does have various meanings, strategies, and identities based on the notions of commercialization, enterprise, good governance, innovation, new venture creation, employability, and others.

Conversely, Kamran et al. (2021) emphasized that entrepreneurial ecosystems are considered as a backbone of any country in socioeconomic development due to their enabling capability to develop business incubators. Due to their obligations for supporting the European Union's Science With and For Society (SWAFS) development plan, business incubators first appeared in public consciousness through entrepreneurial university activities, particularly in public sector universities (EU). The strategy's ultimate purpose is to provide the required scientific and technological support to meet the demands of modern industry. According to Delaney et al. (2020), all policy instruments, including Horizon 2020, should foster the recognition that codesign with people, stakeholders, and end users. Similarly, Bouncken and Kraus (2021); Acs et al. (2017); Roundy et al. (2017); Audretsch et al. (2019); Hannon (2013); and Hannon et al. (2006) also emphasized the concept of entrepreneurial universities' perception that demonstrated the underlying idea of the entrepreneurial ecosystem. It indicated that through entrepreneurial mindset, firms or higher education institutions (HEIs) will have the potential to achieve their advantages over their rivals, uniquely based on their existing resources, knowledge, skills and abilities (KSAs).

Respectively, from the social development perspective point of view, Biggeri et al. (2018) demonstrated that social innovation systems can be illustrated as a phenomenon of the society where multidisciplinary (business people, accounting persons, economists, and sociologists) approaches as well as multistakeholder (policymakers, technocrats, researchers, investors) contributors jointly put their effort to face the challenges and accomplish social needs smoothly, for example, by *providing better working conditions, better education facilities, community development, or healthcare services* than the existing solutions, as well as extending and strengthening the civil society.

Concerning the inclusive perceptions of entrepreneurial universities and the synergetic effect of social innovation ecosystems, Saha and Sáha (2020c) stated that both approaches are interconnected and interrelated for enhancing social entrepreneurship that is embedded in the entrepreneurial discovery process. Related to this issue, Sinclair et al. (2018) mentioned that essentially social innovation can be considered as a “distinctive and effective” approach that emerged in response to meet the unwanted effects, i.e., social problems and needs that prompted and motivated by a social purpose.

Borzaga and Bodini (2012), on the other hand, stated that the goal of social innovation is to not only deal with radical technological change, which is an emergent phenomenon of social entrepreneurship, but also to create an environment for finding alternative solutions and closing social gaps in the market and public sector. It also allows for the identification of the best possible approaches to empower existing human resources, particularly from underserved groups, by activating their core skills and incorporating them in the innovation process (2018, Sinclair et al.).

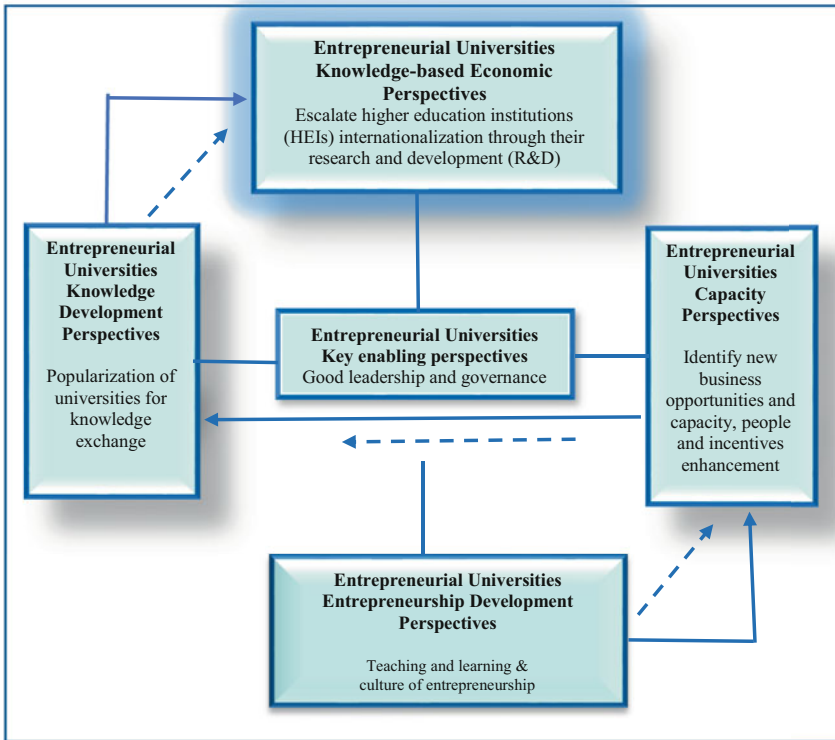
Subsequently, researchers Benneworth and Cunha (2015) also addressed that *entrepreneurial university contributes to social innovation processes which can be recognized by encouraging knowledge development process which helps to move the process forward by facilitating progression between stages, whether through existing knowledge or something co-created with the affected community; making its resources available, whether through direct financial support or access to university infrastructure and assets in the innovation process; and supporting the social innovation process, either by advising social innovators on how to access external knowledge resources or persuading them to do so.*

Furthermore, to indicate entrepreneurial universities’ premeditated role on HEIs’ knowledge-based economic development and social innovation system, Saha et al. (2020b), Saha and Sáha (2020c) too described that entrepreneurial university’s challenging perspectives might be viewed as a crucial way for successful implementation of HEI’s good impact on societal development and technological disruption.

## ***2.1 Entrepreneurial Universities’ Key Enabling Perspectives in the Framework of the HEIs’ Knowledge-Based Economy***

Regarding entrepreneurial universities’ empowering perspectives, Agarwal et al. (2007) and Audretsch and Berlitski (2013) demonstrated that the key enabling role of entrepreneurial universities can be considered as essential support *in society, which is based on its unique tacit knowledge. Furthermore, they also indicated the changing perception of HEIs that has put more emphasis on “entrepreneurial university” as a “third mission” conception.* The OECD’s “A Guiding Framework for Entrepreneurial Universities” (2019) identifies seven specific areas of action and





**Fig. 1** Entrepreneurial universities’ key enabling perspectives support HEIs’ knowledge-based economy (own interpretation)

initiatives, including leadership and governance, organizational capacity, people and incentives, entrepreneurship development in teaching and learning, pathways for entrepreneurs, and university-business/external knowledge exchange relationships to measure and transform institution’s entrepreneurial role through multidimensional digital self-assessment and management tool ([www.heinnovate.eu/en](http://www.heinnovate.eu/en)).

In addition, *entrepreneurial universities’ key attributes (including powerful management and governance, potential incentives, entrepreneurial learning, and sustaining entrepreneurial spirit) mainly facilitate region’s knowledge-driven growth, i.e., regional economic development.* Correspondingly, this study took the initiative to examine how to make the best possible use of the available effective support system, which takes into account all aspects, institutional settings, and resources that may aid future entrepreneur success (Fichter et al., 2016). To identify the entrepreneurial university’s key enabling perspectives and their impact on developing the knowledge development process, it is critical to comprehend how entrepreneurial ecosystems and knowledge-enhancing innovation systems function. Figure 1 depicted entrepreneurial universities’ major enabling views, demonstrating how they support the knowledge-based economy of HEIs. Simultaneously, Shepherd



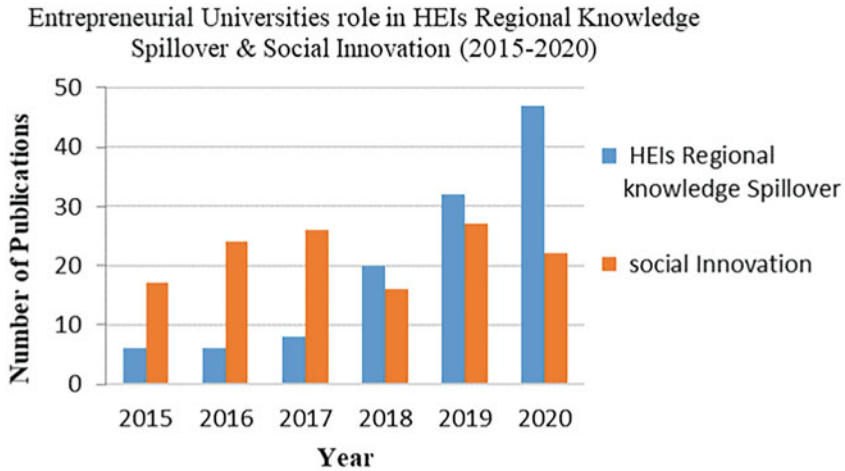
and Patzelt (2011); Kuckertz and Wagner (2010); Parrish (2010); and Abdelkafi and Hansen (2018) also stated that the development of entrepreneurial knowledge spillovers starts within the university context. Correspondingly, they also revealed that universities are also able to support external economic factors that inspires good leadership and governance, enhances organizational capability, induces entrepreneurial learning spirit, develops an interpersonal relationship for university or external relationship for knowledge exchange, and finally escalates higher education institution (HEI) internationalization through research and development (R & D) resources and the establishment of a sustainable development strategy.

However, to investigate the relationships between entrepreneurial universities' key enabling elements and HEIs' knowledge spillover as well as to measure the entrepreneurial dimensions, it is required to know each university and its strategic activities the way they encourage and empower an entrepreneurial spirit within the institutional environment and culture. Mainly it depends on four important dimensions, i.e., human capital, resources, and activities; strategic management and networking and business development environment; popularization and communication activities; and performance indicators as well as a good-practice example. Such as the case of the LISTO project (2020) can be taken into consideration, the way they recommended a three-step approach for analyzing the entrepreneurial dimension of universities as a joint collaborative approach that accelerates the social innovation process and integrates explicit knowledge to achieve social value.

## ***2.2 Entrepreneurial Universities in the Framework of HEIs' Regional Knowledge Spillover and Social Innovation***

Several scholars, such as Agarwal et al. (2007) and Audretsch and Berlitski (2013), stressed that knowledge spillover theory of entrepreneurship primarily benefits to understand how this activity of entrepreneurial ecosystems and knowledge enhancing innovation systems. Similarly, Fichter et al. (2016); Shepherd and Patzelt (2011); Kuckertz and Wagner (2010); Parrish (2010); and Abdelkafi and Hansen (2018) also stated that the development of entrepreneurial knowledge spillovers starts within the university context. The above mentioned scholars also observed that universities can support external economic factors such as SMEs and start-ups develop technology-driven products. As it inspires good leadership and governance, enhances organizational capability, induces entrepreneurial learning spirit, develops an interpersonal relationship for university or external relationship for knowledge exchange, and finally escalate higher education institutions' (HEIs) internationalization through their R & D resources and the implementation of a long-term development strategy.

To indicate entrepreneurial universities' distinctive role in the context of HEIs' regional knowledge spillover as shown below in Fig. 2 (graphical representation showing the last 5 years (2015–2020) citation report from Web of Science database



**Fig. 2** Graphical representation of entrepreneurial universities’ position in HEIs’ regional knowledge development and social innovation during the last 5 years (2015–2020), citation report from WOS

of entrepreneurial universities’ role in HEIs and social innovation). It is necessary to highlight and examine the relative ways of entrepreneurial universities’ innovation-led knowledge spillover that influence social innovation ecosystems in the context of HEIs’ regional knowledge spillover. As a result, it provides regional and organizational significance, as well as competence and knowledge-based economic growth. Furthermore, building unique entrepreneurship- and knowledge-driven innovation hubs requires the dynamic perspective of entrepreneurial universities. Whereas, entrepreneurial universities explored attempts to increase the use of tacit knowledge in regions or countries, knowledge retention in SMEs, and knowledge dynamics (Fuster et al., 2019; Baporikar, 2019).

According to researcher Pugh et al. (2018), entrepreneurial universities’ strategic role as a regional knowledge and innovation component has risen to prominence in recent years. Consequently, Fayolle and Redford (2014) and Mian (2011) also assumed that entrepreneurial universities’ most important additives play a vital function in enhancing regional HEI’s competitiveness that influences regional economic growth and wealth creation.

Correspondingly, to demonstrate entrepreneurial universities’ contributions and influence in social innovation ecosystems, Medvedeva (2015) identified that the social dynamics of entrepreneurial universities are concerned with determining the circumstances of their transformation from knowledge-generating entities to full-fledged civil society elements. More specifically, to comprehend the notion of “entrepreneurial universities” significant role that empowers social innovation, it is necessary to describe its collective approach (AID), i.e., adopting new knowledge, improving existing knowledge, and developing new knowledge to gather information-based social development framework. Consistently, it also explains

that social ventures are dynamic in a wide range of fields, including individual social administrations, metropolitan retrieval, ecological administrations, and the arrangement of other public administrations. As a result, researchers chose to concentrate their efforts on work integration social enterprises (WISEs) in order to facilitate international collaboration (Defourny & Nyssens, 2010; Ahmad et al., 2018).

### ***2.3 Entrepreneurial Universities in the Framework of Social Innovation Ecosystems and Knowledge-Based Economic Development***

In relation to this contentious issue, there is universal agreement that the gap between economic progress and well-being is widening faster than ever before. At the same time, the appearance of entrepreneurial universities' comprehensive perspectives has become one of the main mechanisms of enhancing social as well knowledge-based economic growth nationally and internationally. In addition, it is required to indicate that to meet the societal challenges, the role of an entrepreneurial university's contribution is remarkable. Through academic spin-offs for scaling up innovation, resources, and action to deliver the sustainable development goals, entrepreneurial universities' strategic efforts strengthen the role of social and institutional environments in the social innovation process (SDGs) (Franco-Leal et al., 2020; Saha and Saha 2020c).

Moreover, this chapter put more emphasis on how social innovation ecosystems and knowledge-based economic development imply the significance of entrepreneurial universities, broad perspectives that have been recognized as an effective approach of fostering social innovation system, and knowledge-based economic development through provincial knowledge spillover. Consequently, this study intends to highlight the new challenges and diversity of the socioeconomic contexts. For example:

- Inclusiveness in higher education
- Inclusiveness in innovation
- Inclusiveness in social innovation
- Inclusiveness in the university's developmental process
- Inclusiveness in social development and social entrepreneurship
- Inclusiveness in knowledge-based economic development

Confirming this researcher Johannes Carl (2020) expressed that entrepreneurial university's wide-ranging outlooks have great inspiration on the enduring paradigm shift from technological upbringing to the social development process. His study emphasizes the connectivity of the two emerging research fields of social innovation ecosystems and knowledge-based economic development (i.e., entrepreneurial ecosystems and social innovation ecosystems) that instinctively create social entrepreneurship development. Consequently, it is important to mention the social reform

work of Professor Dr. Muhammad Yunus (2007) in Bangladesh. To alleviate poverty through social innovation and social entrepreneurship development, in 2007, he first took the initiative to spark this concept of a social “innovation” awareness program among academics and researchers (Yunus, 2007; Yunus et al., 2010, 2012).

### 3 Research Method

This study aims to respond to the framework method of the entrepreneurial university and social innovation ecosystem perspectives with a qualitative approach and a review of the literature. It focuses on stimulating and encouraging HEIs to create an entrepreneurial environment for regional knowledge spillover and knowledge-based economic development. Investigates by way of discovery. This qualitative literature review approach includes some forms of constructivist review to have coherent foundations that may support and justify entrepreneurial universities’ different perspectives (Greene, 2006). The purpose of this academic research on entrepreneurial universities is to address the theoretical considerations (*won from diverse researchers’ perceptions of different thematic ideas and perspectives*) that review the entrepreneurial university transformation, entrepreneurial university’s contributions that influence regional knowledge spillover through entrepreneurial capacity enhancement and creation of new business opportunities to facilitate social innovation (Table 1). Based on a logical approach, some important research assumptions have been developed and coined by the conceptual understanding of the entrepreneurial university and social innovation ecosystem. Inductive reasoning, in general, refers to the degree of support for a specific type of knowledge representation that indicates a certain degree of knowledge, which is derived from scientific theories (such as the entrepreneurial discovery process, regional innovation strategy, and knowledge for regional growth) and drew on modern approaches to both strategic and dynamic activities of entrepreneurial universities, the role of higher education institutions (HEIs), and social innovation ecosystems.

In this chapter our research mainly highlighted the following areas:

- Conceptualization of entrepreneurial universities’ role on higher education institutions (HEIs).
- Entrepreneurial universities’ key enabling perspectives and elements that influence regional knowledge spillover related to social innovation.
- Exploratory study on entrepreneurial university and social innovation ecosystems relations.
- Both approaches (entrepreneurial university and social innovation) impact factors that strengthen and enhance regional social innovation potential, and regional knowledge-based economic development.

Concerning this challenging topic, it is crucial to state that the primary goal of this research is not to investigate the operational activities of “entrepreneurial

**Table 1** Research methodology of entrepreneurial university and social innovation ecosystems’ combined effort on HEIs’ knowledge-based economic development (own interpretation)

Main stream of the study	No. of article used from different databases (WOS, SCOPUS & others)	Research subjects	Research question
Entrepreneurial universities and social innovation ecosystems’ different perspectives (Benneworth & Cunha, 2015;. Biggeri et al., 2018)	27 (approx.)	Entrepreneurial university and social innovation processes and elements	Entrepreneurial universities’ contribution in social innovation (how it influences?)
Entrepreneurial university and social innovation ecosystems’ support regional knowledge-based economic development (Fuster et al., 2019; Baporikar, 2019; Carayannis & Campbell, 2012)	30 (approx.)	Entrepreneurial university and social innovation ecosystems’ combined effort on regional knowledge-based economic development	Entrepreneurial university and social innovation ecosystems’ positive effect strengthen and enhance regional social innovation potential, and regional knowledge-based economic development (why it is important for regional knowledge growth?)
Conceptualization of entrepreneurial universities’ role on higher education institutions (HEIs) and knowledge spillover (Audretsch & Link, 2018a, 2018b; Baporikar, 2019)	28 (approx.)	Entrepreneurial universities’ role on higher education institutions (HEIs)	Entrepreneurial universities’ key enabling perspectives and elements influencing regional knowledge spillover (what are the main purposes?)

universities.” Rather, it is necessary to mention that this study mainly focused on highlighting the “entrepreneurial ecosystem that promotes social innovation,” which was done on purpose (that enhances regional knowledge as well as entrepreneurial universities’ innovative capabilities). The purpose of narrowing the definition of entrepreneurial activity, on the other hand, is recognized in the fact that it encourages entrepreneurial universities to be compatible with the conceptual reinforcements of the innovative knowledge development strategy, which is a phronetic iterative approach (i.e., the study of social phenomena based on a contemporary interpretation) of entrepreneurial universities to guide entrepreneurial ecosystem for regional knowledge development and internationalization of entrepreneurial universities.

As a result, this study enables us to understand entrepreneurial universities’ agile perspectives of regional knowledge development and social innovation strategies that stressed HEI’s entrepreneurial activity and raise regional knowledge-enhancing

programs to promote regional economic growth and potentiality. Although the knowledge production process of a creative higher educational institution has a global charm, its application in the framework of Knowledge for Growth (K4G) must be original. As a result, entrepreneurial university activities and social dimensions' considered policy approaches for sustainable development, as well as to inspire the societal development entrepreneurial spirit of their students, play a critical role. Hence, the significance of this study demonstrates that HEI's innovation-driven regional knowledge development strategies foster societal development challenges that distinctively accelerate HEI's internationalization capacity, and learning capability through their research and development (R & D).

#### **4 Entrepreneurial Universities in the Context of Triple Helix, Quadruple Helix, and Inclusive Knowledge-Based Economic Growth**

Responding to this contextual matter of triple helix, quadruple helix, and inclusive knowledge-based economic growth and the relationship between entrepreneurial universities and social aspects, this chapter took the initiative to identify how the social innovation ecosystem can trigger to boost the knowledge-based economic development. Agreeing with this consensus, several scholars also revealed that the inclusive perspectives of entrepreneurial universities have a great impact on the ongoing paradigm shift from technological upbringing to the social development system. Also, it shows that both perceptions have close links with the two emerging research fields of entrepreneurial ecosystems and social innovation ecosystems that automatically initiate social entrepreneurship development.

Similarly, while deliberating the inspiration of entrepreneurial universities' creative and knowledge diffusion activities as well as rational approaches to social innovation, this research investigates how institutional or regional knowledge, innovation, social innovation, and the environment (i.e., natural environment) interact. Relating to this debated issue, it is important to describe the differences between the entrepreneurial and evolutionary triple helix approach and the quadruple helix notion, i.e., distinct modes of knowledge production, in relation to this contentious subject.

Concurring to the issue in the context of "university-industry-government relations," Triple Helix (TH) focuses on knowledge production and application, which discusses the interaction and interrelationship between academics, industry, and government to support economic and social growth, such as knowledge-based economic development and the creation of a knowledge-based society.

On the other hand, quadruple helix (QH) focuses primarily on the need for a university-led community innovation system (CIS), which supplements the lack of and inadequacies of national university institutions in the majority of developing countries. Concerning national universities, it has been observed, that they are

frequently faced with the challenge of demonstrating their knowledge-based economic development (throughout a multi-stage structure of national, international, and trans-national levels) and innovation structures, which are characterized by the aid of using a range of specialized knowledge and social innovation schemes.

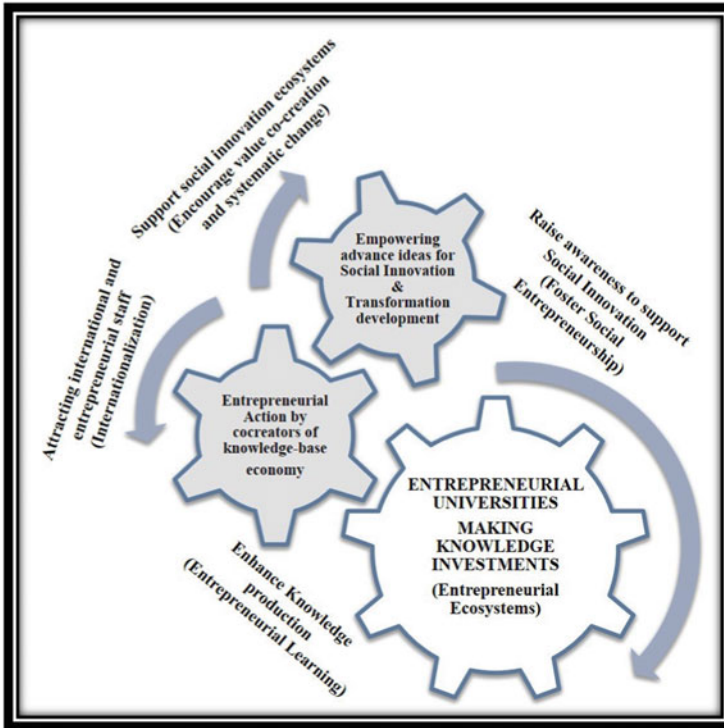
Responding to this approach, numerous researchers, for example, Carl (2020); Etzkowitz and Leydesdorff (2000); and Carayannis and Campbell (2012), emphasized that through this quadruple helix model, national as well as international universities get inspiration to develop the community innovation system in their existing national innovation system that improves people's ability to mobilize and use resources, coordinate knowledge and human capital training, and deploy institutions in order to conduct out favorite experiments on activities and functions carried out by citizens at the grassroots level and in local communities (Carayannis & Campbell, 2009).

Moreover, it has been observed that HEIs' knowledge creation and perception and civil society's community development approach significantly influence TH and QH perspectives. Accordingly, it demonstrates a keen interest in the development of the entrepreneurial ecosystem and social innovation ecosystems, which, on the one hand, stimulate dynamic capabilities for improving institutional attractiveness and, on the other hand, provide a suitable platform for the development of innovative capabilities, stimulating regions and nations to create an innovative environment, though it is not a simple process to initiate the social innovation system and knowledge-based economic growth, especially through correspondence between HEIs' advanced knowledge (innovation) systems and advances (high-quality) of civil society. Consequently, we cannot disagree that nowadays there are several social dimensions of reforming higher education institutions (HEIs) that are supporting the social innovation system.

#### ***4.1 Entrepreneurial Ecosystems and Social Innovation Ecosystems Influence Knowledge-Based Economic Development***

To justify entrepreneurial ecosystems and social innovation ecosystem's influence on knowledge-based economic development, the proposed research direction will be analyzing the significance of entrepreneurial universities' coherent approach. It explains about regional knowledge development process and competitiveness that foster social entrepreneurship, and firms' competitiveness through knowledge-based economic development. The dynamic perspectives of entrepreneurial universities gain considerable attention due to their key enabling inspirations that support HEIs and firms (SMEs) to respond to the challenges of regional knowledge development through expanding business networks to achieve social benefits. Fuster et al. (2019) and Baporikar (2019) also emphasized that entrepreneurial universities support a





**Fig. 3** Thematic model of entrepreneurial ecosystems' and social innovation ecosystems' influence on regional knowledge-based economic development (own interpretation)

regional knowledge-based innovation system and promote the tacit knowledge of regions, businesses, and higher education institutions.

Furthermore, Fig. 3 depicts the significance of entrepreneurial ecosystems and social innovation ecosystems' influence on regional knowledge-based economic development. Figure 3 illustrates mainly *three important elements of entrepreneurial universities*:

- That is, *entrepreneurial universities' entrepreneurial learning and teaching capabilities*
- *Entrepreneurial universities' internationalization capabilities*
- *Entrepreneurial universities' social awareness and regional value creation capabilities through regional knowledge spillover which were all arranged around the question of how entrepreneurial universities' entrepreneurial ecosystems and social innovation ecosystems influence on knowledge-based economic development*

Conversely, the current study also highlighted that social innovation, social entrepreneurship, and entrepreneurial university's inclusive perceptions facilitate encourage and expedite to cope up with the societal challenges, social needs, and

systematic social change. It enhances the capacity to adopt the change and create social entrepreneurship and facilitates the regions to compete successfully in order to promote entrepreneurial network spirit and innovation-driven regional and societal growth (Saha et al., 2020a, 2020b; Saha and Saha 2020c).

However, more precisely the role of entrepreneurial universities' strategic initiatives, i.e., entrepreneurial ecosystems, has been seen to stimulate the following features, such as:

- Empowering advanced ideas for social innovation and transformation development – that raise awareness to support social innovation (*foster social entrepreneurship*)
- Encouraging entrepreneurial action by co-creators of the knowledge-based economy – that enhance knowledge production (*entrepreneurial learning*)
- Stimulating support social innovation ecosystems – that encourage (*social value co-creation and systematic change*)
- Enhancing knowledge development process – that attract international and entrepreneurial staff (*internationalization*)

Mainly it is accentuating more than the traditional commercialization activities, and notably, in developing countries, it is one of the crucial aspects of escalating the social innovation system through systemic change and boosting knowledge-based economic development.

Furthermore, Muktadir-Al-Mukit et al. (2016) identified that entrepreneurial universities place a greater emphasis on good governance and leadership for developing entrepreneurial thinking than on technology transfer (patents, spin-offs, and start-ups), indicating that entrepreneurial and social innovation ecosystems have a positive impact on regional knowledge-based economic development. In addition, the study of Kruja, 2013 also focuses on the strategic role of entrepreneurial universities as a vital provider of support and services to local populations. Conversely, to represent entrepreneurial universities' attitudes toward knowledge-based investment especially highlighted on people, i.e., human resources from an organizational culture perspective, it demonstrates a positive attitude for institutions knowledge development, as well as promoting the attitude of entrepreneurial growth. The example of Global Entrepreneurship Monitor (GEM) is also investigating to boost their knowledge-based economic development (Kruja (2013); Ghouse et al. (2021); Cunha and Benneworth (2013)).

However, Kirby et al. (2011); Păunescu et al. (2013); and Audretsch and Link (2018a) recognized that there is a possible and coherent link that exists between social responsibility and social entrepreneurship in higher education institutions (HEIs) that are required to be addressed while emphasizing entrepreneurial universities' strategic initiatives and ecosystems. Similarly, entrepreneurial universities' active engagement in regional development can also be seen in commercializing their expertise through spin-offs, patents, and licensing, according to Audretsch and Link (2018b) and Olo et al. (2020). Also, in this way regions gain profit through job creation, spin-offs, knowledge spillovers, and the attraction of new talents.

Furthermore, to gain a better understanding of how entrepreneurial universities are assisting HEIs in their knowledge-based economic development, it is required to highlight the example of “NESTA” (Kitson et al., 2009) (displaying innovation setup in UK universities). It has been also observed that nowadays universities have been projecting their consideration significantly and more comprehensively, for conventional exchange of protected innovation of their industry to grow worldwide, and uniting thinking process and practice.

To justify the question of how, why, and what are the major aims of entrepreneurial universities and social innovation in supporting HEIs’ knowledge-based economic development, this research induces us to apprehend the subsequent three crucial research propositions (RPs).

*RP1:* This research proposition states that entrepreneurial universities’ and social innovation ecosystems’ combined effect on HEIs’ knowledge development strategy is considered to be the most important factor and procedure for building HEIs and innovative capabilities. In the context of the regional knowledge development plan, the knowledge acquisition process of creative institutions has a global impact. So, there is a vibrant role aimed at entrepreneurial universities’ ecosystems and HEIs’ knowledge development attitudes for sustainable development to carry out a systematic study about the entrepreneurial universities’ strategies that mainly focuses on HEIs’ knowledge-based economic development (i.e., *the intrinsic role of entrepreneurial universities and the combined efforts of social innovation policies have a symbiotic impact on socioeconomic improvement. Even though the dynamism of regional knowledge development strategies also has a vibrant effect on entrepreneurial ecosystems, the entrepreneurial discovery process (EDP) creates a smart, inclusive, growth-based entrepreneurship attitude throughout the region.*

*RP2:* In this research proposition, it demonstrates entrepreneurial universities the right path for knowledge-driven growth and societal engagement that will promote social entrepreneurship (SE) and social innovation (SI). On the other hand, this study also determines entrepreneurial universities’ premeditated role that has a vast impact on HEIs’ knowledge-based regional growth. However, it is an important policy approach of developing regional associations and institutions to induce creative activities that encompass the region with knowledge which is Europe’s future prosperity. Mainly it depends on the region’s ability to leverage, and citizens (well-being), i.e., *entrepreneurial universities’ inclusion and social innovation ecosystems are critical for achieving millennium development objectives and sustainable development goals that encourage the growth of social enterprises.*

*RP3:* This argument emphasized the dual perspective of entrepreneurial universities’ strategic ambitions and regional innovation plans, which encouraged regional knowledge-based economic development. On the other hand, the social innovation system’s dynamic capabilities their priorities, elements, and fundamental aspects also play an important role (which is based on the opinion of the different countries’ academic experts as well as the EU framework), since both notions, namely, the positive impact of entrepreneurial universities and the prospective priorities of social innovation strategies, have provided a comparative overview of higher education institutions’ activities on entrepreneurial ecosystems and growth-oriented

entrepreneurship development. Therefore, it's far assumed *that the high-performing entrepreneurial universities' value-added activities will inspire higher education institutions and creative regions to achieve sustainable development goals (i.e., to achieve a competitive advantage by establishing entrepreneurial universities that improve knowledge production) (entrepreneurial learning).*

This chapter confers about the significant benefits that the entrepreneurial universities will acquire in association with the social innovation process, which influences the entrepreneurial universities' *formal, informal factors, resources, and capabilities* in order to enhance knowledge-based economic development. The following research proposition statements were formulated in the context of numerous researchers (Benneworth and Cunha, 2015; Biggeri et al., 2018; Audretsch and Link, 2018a, 2018b; Baporikar, 2019) as well as other eminent researchers (Benneworth and Cunha, 2015; Biggeri et al., 2018; Audretsch and Link, 2018a, 2018b; Baporikar, 2019) and other eminent researchers:

- RP1: Enable the identification of new business prospects and the enhancement of knowledge development capability, human resource development capability, and overall regional economic development capability
- RP2: Enhance university-business/external knowledge exchange partnerships
- RP3: Increase HEI globalization and value co-creation in society

Therefore, the consequence of this study represents that entrepreneurial universities play a crucial role in spreading and widening the twinning perspective of HEIs' innovative capabilities and societal development that fosters knowledge-based economic development.

## 5 Recommendations and Conclusion

Based on our previous discussion this study revealed that HEIs' knowledge development approaches include a number of powerful mechanisms that foster an entrepreneurial mindset by providing the right leaders, selecting appropriate members of governing bodies and senior administrators of HEIs to accelerate regional governance (i.e., to encourage and stimulate industrial competitiveness within the region through entrepreneurial learning and enhancing institutional innovation), and attracting an entrepreneurial spirit and ecosystem through internationalization of SMEs. Last but not least, this chapter's main revelations are as follows: entrepreneurial universities' deliberated efforts and higher education institutions' knowledge production approach play a significant influence in enhancing knowledge-driven innovation and community innovation system that enable to sustain knowledge-based economic growth. Additionally, this chapter also confers significant benefits that the entrepreneurial universities will acquire in association with the social innovation process, which influences the entrepreneurial universities' *formal, informal factors, resources, and capabilities* in order to enhance HEI's knowledge-based economic development, though some intervention may occur, which restricts the

entrepreneurial activity that encourages their participation in the modern knowledge economy.

*From an implication's point of view*, this chapter is a pragmatic literature review, and thus it is partially limited to discuss the relative approaches of entrepreneurial ecosystems and social innovation ecosystems that debate HEIs' innovation and knowledge-driven economic growth. It is not merely enough for academics, policymakers, and social innovators to come together and resolve the socioeconomic impacts that stimulate knowledge-based economic development.

*From the practical implications, academic perspectives, and social dimensions' point of view as well as future expectations' point of view*, it is essential to mention that, practically, this chapter may provide some interesting insights and suggestions for those seeking to increase universities' contributions to a knowledge-based economy with the emergence of social innovative process that fosters social entrepreneurship.

*Academically, this conceptual chapter might also additionally inspire the young generations to move for better research on entrepreneurial and social innovation ecosystems and expand an entrepreneurial thought setup for social change.*

*Socially, this chapter should empower current HEIs and their universities to make a critical contribution to satisfy the societal demanding via universities' multidisciplinary teaching and study activities.* Henceforth, it can be understood that the perception of entrepreneurial universities' HEI's regional knowledge spillover strategy has been observed as an important strategic initiative that relates HEI's knowledge development process through social innovation ecosystems and entrepreneurial ecosystems. Briefly, it may be stated that an entrepreneurial university's formal elements (i.e., capitalization of know-how, interdependence with the enterprise and government, independence with different institutional spheres, hybrid professional HEIs' forms, and renovation of high-skilled manpower) additionally play a critical position in accelerating regional knowledge spillover process. More specifically, it can be said that this thematic chapter has mainly demonstrated entrepreneurial ecosystems and social innovation ecosystem's influence on regional knowledge-based economic growth.

In addition, also from the future research perspective point of view, this research recommended that the presence of initiative leaders' authoritative decision-making skills in HEIs will nurture innovation through implementing industrial competitiveness, enhancing regional knowledge production within the region, and solving problems that arise among higher education institutions either for proper access to education or for improving the quality of education, the social innovation system and/or process that contains some powerful instruments that encourage researchers, policymakers, and young generations to have an innovative mindset. Thus, in a nutshell, it can be speculated that the existing knowledge spillover within the institutions has influenced the creation of new knowledge and cross-disciplinary areas of research. It empowers regional small firms and HEIs to cope with economic, social, and industrial challenges. In this chapter authors mainly explore the impact of entrepreneurial universities' ecosystems, boosting HEIs' knowledge development process and knowledge spillovers and encouraging social innovation. Additionally,

it is essential to highlight that current research on entrepreneurial universities' dynamic capabilities and emerging approaches have coined considerable attention due to its key enabling inspirations that facilitate HEIs and small firms (SMEs) to meet the socioeconomic development and regional sustainable development goals.

Furthermore, from the HEIs' regional knowledge-based economic development point of view, this new instrument of upcoming regional innovation strategy (RIS) will attempt to address economically critical issues from regions from different least developed countries (LCD) or developed countries (DC) and underdeveloped countries (UDC) nationally as well as internationally. Therefore, it is expected that regional policymakers, academicians, industrialists, and entrepreneurs will provide extra attention, especially for the benefit of regional science, regional economic geography, and regional economic sociology, and expand the international business opportunities for future generations through HEI's initiatives and promotional activities. As a result, the implementation of entrepreneurial spirit, the regional development strategy will remove impediments to globalization, due to the prominence of entrepreneurial universities, i.e., HEIs, innovation-driven regional knowledge-based economic development, and societal development. Therefore, it can be assumed that this *regional knowledge development strategy and entrepreneurial university's strategic* initiatives will have the potential benefit of enhancing sustainable regional economic constancy.

Furthermore, the analysis revealed that both activities, to some extent, have global relevance. To confront global difficulties, nowadays the role of HEI's entrepreneurial discovery process will not only facilitate regional knowledge spillover, but it will also enable and facilitate to determine and combine the best feasible path forward, i.e., how regions may strengthen their present resources' competitiveness while also creating social value in this changing world. According to the findings of this study, implementing entrepreneurial universities' dynamic capabilities and knowledge-inclusive perspectives may be a more challenging and sophisticated approach. Therefore, from the regional economic development point of view, nowadays, this approach is fascinating to most of the promising HEIs of EU member countries.

**Acknowledgments** This research work is supported by the institutional project entitled "Process of implementing a Human Resources Strategy for Researchers (HRS4R)" and development of TBU research and development capacities in Zlín, Reg. No. CZ.02.2.69/0.0/0.0/16\_028/0006243. It is conducted within the framework of COST Action CA 18236 "SHIINE" (<https://socialchangelab.eu/>). The first author is thankful to the Director of the University Institute for providing a management support system (MSS) and infrastructure facility to carry out this contemporary research. Also, the first author dedicates this study to her only beloved son "Kanishka Binayak Saha" and her beloved father "Chittaranjan Saha."

## References

- Abdelkafi, N., & Hansen, E. G. (2018). Ecopreneurs' creation of user business models for green tech: An exploratory study in E-mobility. *International Journal of Entrepreneurial Venturing*, *10*(1), 32–55.
- Acs, Z. J., Stam, E., Audretsch, D. B., & O'Connor, A. (2017). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, *49*(1), 1–10.
- Agarwal, R., Audretsch, D., & Sarkar, M. B. (2007). The process of creative construction: Knowledge spillovers, entrepreneurship, and economic growth. *Strategic Entrepreneurship Journal*, *1*, 263–286.
- Ahmad, N. H., Halim, H. A., Ramayah, T., Popa, S., & Papa, A. (2018). The ecosystem of entrepreneurial university: The case of higher education in a developing country. *International Journal of Technology Management*, *78*(1–2), 52–69.
- Audretsch, D., & Berlitski, M. (2013). The missing pillar: The creativity theory of knowledge spillover entrepreneurship. *Small Business Economics*, *41*, 819–836.
- Audretsch, D. B., Cunningham, J. A., & Kuratko, D. F. (2019). Entrepreneurial ecosystems: Economic, technological, and societal impacts. *The Journal of Technology Transfer*, *44*, 313–325. <https://doi.org/10.1007/s10961-018-9690-4>
- Audretsch, D. B., Hülsbeck, M., & Lehmann, E. E. (2012). Regional competitiveness, university spillovers, and entrepreneurial activity. *Small Business Economics*, *39*(3), 587–601.
- Audretsch, D. B., & Link, A. N. (2018a). Entrepreneurship and knowledge spillovers from the public sector. In *UNCG Economics Working Papers no: 18–5, August*. Department of Economics, University of North Carolina at Greensboro.
- Audretsch, D. B., & Link, A. N. (2018b). *Sources of knowledge and entrepreneurial behavior*. University of Toronto Press.
- Balaton, K., Benedek, J., Kocziszky, G., & Somosi, M. V. (2016). Generating and measuring regional social innovation. *Theory, Methodology, Practice*, *12*, 14–25.
- Baporikar, N. (2019). Significance and role of entrepreneurial University in Emerging Economies. *International Journal of Applied Management Sciences and Engineering (IJAMSE)*, *6*, 46–46.
- Benneworth, P., & Cunha, J. (2015). Universities' contributions to social innovation: Reflections in theory & practice. *European Journal of Innovation Management*, *18*(4), 508–527. <https://doi.org/10.1108/EJIM-10-2013-0099>
- Bezanilla, M. J., García-Olalla, A., Paños-Castro, J., & Arruti, A. (2020). Developing the entrepreneurial university: Factors of influence. *Sustainability*, *12*(3), 1–16. <https://doi.org/10.3390/su12030842>
- Biggeri, M., Testi, E., Bellucci, M., During, R., & Persson, H. T. R. (2018). *Social entrepreneurship and social innovation ecosystems for inclusion in Europe*. Routledge. ISBN: 978-0-815-37579-1.
- Borzaga, C., & Bodini, C. (2012). What to make of social innovation? Towards a framework for policy development. In *EURICSE, Working Paper No. 036 /12*. EURICSE.
- Bouncken, R. B., & Kraus, S. (2021). Entrepreneurial ecosystems in an interconnected world: Emergence, governance and digitalization. *Review of Managerial Science*. <https://doi.org/10.1007/s11846-021-00444-1>
- Brundenius, C., Göransson, B., & Carvalho de Mello, J. M. (2017). *Universities* (Vol. 403). An International Perspective. eBook. ISBN: 978-3-319-43700-2, Springer International Publishing. <https://doi.org/10.1007/978-3-319-43700-2>
- Cai, Y., & Ahmad, I. (2021). From an entrepreneurial university to a sustainable entrepreneurial university: Conceptualization and evidence in the contexts of European university reforms. *Higher Education Policy*. <https://doi.org/10.1057/s41307-021-00243-z>
- Carayannis, E., & Campbell, D. F. (2012). Triple helix, quadruple helix and quintuple helix and how do knowledge, innovation and the environment relate to each other?: A proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. In



- E. Carayannis (Ed.), *Sustainable policy applications for social ecology and development* (pp. 29–59). IGI Global. <https://doi.org/10.4018/978-1-4666-1586-1.ch004>
- Carayannis, E. G., & Alexander, J. M. (2006). *Global and local knowledge*. Glocal transatlantic public-private partnerships for research and technological development. Houndmills.
- Carayannis, E. G., & Campbell, D. F. J. (2006). In E. G. Carayannis & D. F. J. Campbell (Eds.), *Knowledge creation, diffusion, and use in innovation networks and knowledge clusters. A comparative systems approach across the United States, Europe and Asia* (pp. 1–25). Praeger.
- Carayannis, E. G., & Campbell, D. F. J. (2009). “Mode 3” and “quadruple helix”: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, 46(3/4), 201–234. <https://doi.org/10.1504/IJTM.2009.023374>
- Carayannis, E. G., & Campbell, D. F. J. (2010). Triple helix, quadruple helix and quintuple helix and how do knowledge, innovation, and environment relate to each other? *International Journal of Social Ecology and Sustainable Development*, 1(1), 41–69.
- Carayannis, E. G., & von Zedtwitz, M. (2005). Architecting gloCal (global – Local), real-virtual incubator networks (G-RVINS) as catalysts and accelerators of entrepreneurship in transitioning and developing economies. *Technovation*, 25, 95–110.
- Carl, J. (2020). From technological to social innovation – The changing role of principal investors within entrepreneurial ecosystems. *Journal of Management Development*, 1(1), 1–14.
- CEC. (2008). *Challenging Europe’s research: Rationales for the European research area (ERA)*. Commission of the European Communities.
- CEC. (2010). 2020 final Europe 2020: A strategy for smart, sustainable and inclusive growth, Brussels: Commission of the European Communities, COM(2010) final, Retrieved from <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>
- Clark, B. R. (1998). *Creating entrepreneurial universities*. Pergamon.
- Cruz, M., Ferreira, J. M., & Kraus, S. (2021). Entrepreneurial orientation at higher education institutions: State-of-the-art and future directions. *The International Journal of Management Education*, 19(2), 1–15. <https://doi.org/10.1016/j.ijme.2021.100502>
- Cunha, J., & Benneworth, P. (2013). Universities’ contributions to social innovation: Towards a theoretical framework. In *EURA, Conference Paper*.
- Daniel, A. D., Teixeira, A. A., & Preto, M. T. (2020). *Examining the role of entrepreneurial universities in regional development* (pp. 1–360). IGI Global. <https://doi.org/10.4018/978-1-7998-0174-0>
- Defourmy, J., & Nyssens, M. (2010). Conceptions of social enterprise and social entrepreneurship in Europe and the United States: Convergences and divergences. *Journal of Social Entrepreneurship*, 1(1), 32–53. <https://doi.org/10.1080/19420670903442053>
- Delaney, N., Tornasi, Z., Iagher, R., Monachello, R., & Warin, C. (2020). *Science with and for Society in Horizon 2020 Achievements and Recommendations for Horizon Europe*. ISBN 978-92-76-17249-9 doi:10.2777/32018, KI-01-20-165-EN-N. Publications Office of the European Union.
- EC-OECD. (2012). *A guiding framework for entrepreneurial universities*. European Commission. Retrieved from <https://www.oecd.org/site/cfecpr/ECOECD%20Entrepreneurial%20Universities%20Framework.pdf>
- Etzkowitz, H. (2004). The evolution of the entrepreneurial university. *International Journal of Technology and Globalization*, 1(1), 64–77.
- Etzkowitz, H., & Klofsten, M. (2005). The innovating region: Toward a theory of knowledge-based regional development. *R & D Management*, 35(3), 243–255.
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and “mode 2” to a triple helix of university-industry-government relations. *Research Policy*, 29, 109–123.
- Fayolle, A., & Redford, D. (2014). Introduction: Towards more entrepreneurial universities – Myth or reality? In A. Fayolle & D. Redford (Eds.), *Handbook on the entrepreneurial university* (pp. 1–10). Edward Elgar.

- Ferreira, J. A. E., Fayolle, A., Ratten, V., & Raposo, M. (Eds.). (2018). *Entrepreneurial universities collaboration, education and policies*. Cheltenham, UK: Edward Elgar publishing 2018. 288 pp. *International Entrepreneurship and Management Journal*, 14, 1131–1133. <https://doi.org/10.1007/s11365-018-0535-2>
- Fichter, K., Geier, J., & Tiemann, I. (2016). *Good practice collection – University support for sustainable entrepreneurship*. SHIFT.
- Franco-Leal, N., Camelo-Ordaz, C., Dianeze-Gonzalez, J. P., & Sousa-Ginel, E. (2020). The role of social and institutional contexts in social innovations of Spanish academic spinoffs. *Sustainability*, 12(3), 906.
- Fuster, E., Padilla-Melendez, A., Lockett, N., & Rosa Del-Aguila-Obra, A. (2019). The emerging role of university spin-off companies in developing regional entrepreneurial university ecosystems: The case of Andalusia. *Technological Forecasting and Social Change*, 141, 219–231.
- Ghouse, S. M., Barber, D., Harris, L. M., & Gibson, S. H. (2021). Role of gender and exposure on entrepreneurial attitudes of Omani university students. *Journal for International Business and Entrepreneurship Development*, 13(1), 1–22.
- Greene, J. C. (2006). Towards a methodology of mix methods social inquiry. *Research in the Schools*, 13(1), 93–98.
- Guerrero, M., & Urbano, D. (2012). The development of an entrepreneurial university. *Journal of Technology Transfer*, 37, 43–74. <https://doi.org/10.1007/s10961-010-9171-x>
- Guerrero, M., & Urbano, D. (2010). The development of an entrepreneurial university. *Journal of Technology Transfer*, 37, 43–74. <https://doi.org/10.1007/s10961-010-9171-x>
- Hannon, D. P. (2013). Why is the entrepreneurial university important? *Journal of Innovation Management*, 1(2), 10–17.
- Hannon, P. D., Scott, J., Sursani, S. R., & Millman, C. (2006). The state of education provision for Enterprise and entrepreneurship: A mapping study of England's HEIs. *International Journal of Entrepreneurship Education*, 4, 41–72.
- Heaton, S., Siegel, D., & Teece, D. (2019). Universities and innovation ecosystems: A dynamic capabilities perspective. *Industrial and Corporate Change*, 28(4), 921–939. <https://doi.org/10.1093/icc/dtz038>
- Jami, Y., & Gökdeniz, İ. (2020). The role of universities in the development of entrepreneurship. *Entrepreneurship Education*, 16(1). <https://doi.org/10.24917/20833296.161.7>. ISSN 2083-3296.
- Jarohnovich, N., & Avotīņš, C. V. (2013). The changing role of the entrepreneurial University in Developing Countries: The case of Latvia. *Journal of Higher Education, Theory, and Practice*, 13, 121–148.
- Kamran, A. S., Al-Shaikh, M. E., Ishtiaq, A. B., & Al-Subaie, A. (2021). Identifying critical success factors for university business incubators in Saudi Arabia. *Entrepreneurship and Sustainability Issues*, 8(3), 267–279.
- Kirby, D. A. (2004). Entrepreneurship education: Can business schools meet the challenge? *Education and Training*, 46(8/9), 510–519.
- Kirby, D. A. (2006). Creating entrepreneurial universities in the UK: Applying entrepreneurship theory to practice. *Journal of Technology Transfer*, 31(5), 599–603.
- Kirby, D. A., Guerrero, M., & Urbano, D. (2011). The theoretical and empirical side of entrepreneurial universities: An institutional approach. *Canada Journal of Administrative Sciences*, 28(3), 302–316.
- Kitson, M., Howells, J., Braham, R., & Westlake, S. (2009). The connected university driving recovery and growth in the UK economy. In *NESTA making innovation flourish. Research Report 2009*. Retrieved from [https://media.nesta.org.uk/documents/the\\_connected\\_university.pdf](https://media.nesta.org.uk/documents/the_connected_university.pdf)
- Kruja, A. (2013). Entrepreneurship and knowledge-based economies. *Romanian Journal for Multidimensional Education*, 5(1), 7–17.

- Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions — Investigating the role of business experience. *Journal of Business Venturing*, 25(5), 524–539.
- Lehmann, E. E., Meoli, M., Paleari, S., & Stockinger, S. A. E. (2020). The role of higher education for the development of entrepreneurial ecosystems. *European Journal of Higher Education*, 10(1), 1–9. <https://doi.org/10.1080/21568235.2020.1718924>
- LISTO Project. (2020). *LISTO toolkit for entrepreneurial universities*. Uppsala University. Retrieved from [https://listoproject.eu/wp-content/uploads/2020/12/LISTO\\_Toolkit\\_EntrepreneurialUniversities\\_English.pdf](https://listoproject.eu/wp-content/uploads/2020/12/LISTO_Toolkit_EntrepreneurialUniversities_English.pdf)
- Medvedeva, T. A. (2015). University education: The challenges of 21st century. *Procedia - Social and Behavioral Sciences*, 166, 422–426.
- Mian, S. (2011). University's involvement in technology business incubation: What theory and practice tell us? *International Journal of Entrepreneurship and Innovation Management*, 13(2), 113–121.
- Morawska-Jancelewicz, J. (2021). The role of universities in social innovation within quadruple/quintuple helix model: Practical implications from polish experience. *Journal of Knowledge Economy*, 1–42. <https://doi.org/10.1007/s13132-021-00804-y>
- Moulaert, F., Martinelli, F., Gonzalez, S. & Swyngedouw, E. (2007). 'Introduction: Social Innovation and Governance in European Cities. Urban development between path-dependency and radical innovation', *European Urban and Regional Studies* 14(3), 195–209.
- Moulaert, F., & Nussbaumer, J. (2005a). The social region: Beyond the territorial dynamics of the learning economy. *European Urban and Regional Studies*, 12(1), 45–64.
- Moulaert, F., & Nussbaumer, J. (2005b). Defining the social economy and its governance at the Neighbourhood level: A methodological reflection. *Urban Studies*, 42(11), 2071–2088.
- Muktadir-Al-Mukit, D., Ashraf, M. M., Rahman, S., & Amir Khasru, A. F. M. (2016). The role of social business towards development: Case study of Bangladesh Australia and New Zealand. *Journal of Social Business, Environment and Sustainability*, 2(2), 153–173.
- OECD/European Union. (2019). Applying the HEInnovate framework to higher education in Italy. In *Supporting Entrepreneurship and Innovation in Higher Education in Italy*. OECD Publishing. <https://doi.org/10.1787/55bb258f-en>
- Olo, D. P., Correia, L., & da Conceição Rego, M. (2020). The Main challenges of higher education institutions in the 21st century: A focus on entrepreneurship. In *Examining the role of entrepreneurial universities in regional development* (pp. 1–23). IGI Global.
- Parrish, B. D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. *Journal of Business Venturing*, 25, 510–523.
- Păunescu, C., Drăgan, D., Cantaragiu, R., & Filculescu, A. (2013). Towards a conceptualization of social entrepreneurship in higher education. *The International Journal of Management Science and Information Technology (IJMSIT)*, 10(Dec), 51–69.
- Pinheiro, R., Langa, P. V., & Pausits, A. (2015). One and two equals three? The third Mission of higher education institutions. *European Journal of Higher Education*, 5(3), 233–249.
- Pugh, R., Lamine, W., Jack, S., & Hamilton, E. (2018). The entrepreneurial university and the region: What role for entrepreneurship departments? *European Planning Studies*, 26(9), 1835–1855.
- Ratten, V., & Jones, P. (2021). Covid-19 and entrepreneurship education: Implications for advancing research and practice. *The International Journal of Management Education*, 19(1), 100432. <https://doi.org/10.1016/j.ijme.2020.100432>
- Roundy, P. T., Brockman, B. K., & Bradshaw, M. (2017). The resilience of entrepreneurial ecosystems. *Journal of Business Venturing Insights*, 8, 99–104.
- Saha, N., Sáha, T., & Sáha, P. (2020a). Entrepreneurial Universities' strategic role in accelerated innovation for regional growth. In A. D. Daniel, A. A. Teixeira, & M. T. Preto (Eds.), *Examining the role of entrepreneurial universities in regional development* (pp. 51–65). IGI Global. <https://doi.org/10.4018/978-1-7998-0174-0.ch003>

- Saha, N., Sáha, T., & Sáha, P. (2020b). Entrepreneurial universities perception and regional innovation system: Do they really create an environment for regional economic development? *Journal of Entrepreneurship Education*, 23(2), 1–15.
- Saha, N., & Sáha, P. (2020c). Entrepreneurial universities inclusive perspective: Does it trigger social innovation process and entrepreneurship? In *Proceedings of the European conference on innovation and entrepreneurship, ECIE [online]* (pp. 568–577). Academic Conferences and Publishing International Limited. ISSN 2049-1050.
- Science with and for Society in Horizon. (2020). Retrieved from [https://apre.it/wp-content/uploads/2021/05/KI0120165ENN.en\\_.pdf](https://apre.it/wp-content/uploads/2021/05/KI0120165ENN.en_.pdf)
- Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking ‘what is to be sustained’ with ‘what is to be developed’. *Entrepreneurship Theory and Practice*, 35(1), 137–163.
- Sinclair, S., Mazzei, M., Baglioni, S., & Roy, M. J. (2018). Social innovation, social enterprise, and local public services: Undertaking transformation? *Social Policy and Administration*, 52, 1317–1331. <https://doi.org/10.1111/spol.12389>
- Sperrer, M., Müller, C., & Soos, J. (2016). The concept of the entrepreneurial university applied to universities of Technology in Austria: Already reality or a vision of the future? *Technology Innovation Management Review*, 6(10), 37–44. <https://doi.org/10.22215/timreview/1026>
- Sporn, B. (2001). Building adaptive universities: Emerging organisational forms based on experiences of European and US universities. *Tertiary Education and Management*, 7(2), 121–134.
- Thomas, E., & Pugh, R. (2020). From ‘entrepreneurial’ to ‘engaged’ universities: Social innovation for regional development in the global south. *Regional Studies*, 54(12), 1631–1643. <https://doi.org/10.1080/00343404.2020.1749586>
- Urbano, D., & Guerrero, M. (2013). Entrepreneurial universities: Socio-economic impacts of academic entrepreneurship in a European region. *Economic Development Quarterly*, 27(1), 40–55.
- Yunus, M. (2007). *Creating a world without poverty: Social business and the future of capitalism*. Public Affairs.
- Yunus, M., Moingeon, B., & Lehmann-Ortega, L. (2010). Building social business models: Lessons from the Grameen experience. *Long Range Planning*, 43, 308–325.
- Yunus, M., Sibieude, T., & Lesueur, E. (2012). Social business and big business: Innovative, promising solutions to overcome poverty? *Field Actions Science Reports*, 4, 68–74.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

