

# **Mutations de l'université « Vers une université entrepreneuriale » : Revue de la littérature**

## **University Transformations “Towards an Entrepreneurial University”: A Literature Review**

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## Résumé

Etant donné son rôle central dans le développement du capital humain, dans la valorisation de la recherche scientifique et dans la transmission des valeurs, l'université fait partie des établissements concernés par la promotion de l'entrepreneuriat.

En effet, les missions universitaires classiques de la formation et de la recherche doivent être revues en faveur d'une nouvelle approche axée sur l'entrepreneuriat, qui contribuera à l'avancement social et économique.

La présente contribution s'inscrit dans ce contexte d'analyse, elle a pour objet d'établir une revue de littérature narrative sur le concept de l'entrepreneuriat, l'évolution de l'université et de ses missions en mettant en exergue le concept de l'université entrepreneuriale et ses principaux modèles théoriques, et en dressant une synthèse de certaines études empiriques portant sur les liens entre l'université, l'entrepreneuriat et l'écosystème entrepreneurial.

Les résultats de la présente revue de littérature montrent que la gouvernance, les ressources, la culture, les politiques publiques, et l'écosystème constituent des facteurs clés de développement d'une université entrepreneuriale. Par ailleurs et grâce à la formation entrepreneuriale, aux dispositifs d'accompagnement, et aux partenariats université-industrie, l'université entrepreneuriale au Maroc peut contribuer à la promotion des intentions entrepreneuriales, à la création de spin-offs, à l'employabilité et au développement régional.

**Mots clés :** entrepreneuriat, université entrepreneuriale, formation, accompagnement, écosystème entrepreneurial.

## Abstract

In view of its central role in the development of human capital, in the valorization of scientific research, and in the transmission of values, the university is among the institutions concerned with promoting entrepreneurship.

Indeed, the classic university missions of education and research must be reviewed, in favor of a new approach oriented on entrepreneurship that contribute to social and economic growth.

This paper is part of this analytical context and aims to establish a narrative literature review on the concept of entrepreneurship and the evolution of the university and its missions, by highlighting the concept of the entrepreneurial university and its main theoretical models, and by providing a synthesis of empirical studies on the links between the university, entrepreneurship, and the entrepreneurial ecosystem.

The results of this literature review show that governance, resources, culture, public policies, and the ecosystem are key factors in the development of an entrepreneurial university. Furthermore, thanks to entrepreneurial training, support mechanisms, and university-industry partnerships, the entrepreneurial university in Morocco can contribute to the promotion of entrepreneurial intentions, the creation of spin-offs, employability, and regional development.

**Keywords:** Entrepreneurship, entrepreneurial university, training, support, entrepreneurial ecosystem.

## Introduction

Today, the success of national and regional economies depends on their ability to produce innovation in an environment characterized by the development of the knowledge economy. Consequently, governments are now encouraging a strong relationship between the academic and industrial sectors for the development of new and socially beneficial knowledge.

Moreover, in the context of the development of the knowledge economy and the important challenges that characterize the current economic context related to youth growth and employability, it becomes necessary for the university to evolve from a traditional university to a “new” and “flexible” one, which can not only adapt to changes but also drive them. (Gibbons, 1998, pp 5-7).

Indeed, the idea behind the development of the entrepreneurial university concept is to transform institutions and their academic roles, in order to better link academic missions with economic development (Etzkowitz et al., 2000; Marginson & Considine, 2000; Slaughter & Leslie, 1997). In this context, it becomes necessary to investigate and determine the elements that will enable the Moroccan university ecosystem to develop into an entrepreneurial university, acting on both entrepreneurial attitude and entrepreneurial aptitude through the adoption of an entrepreneurial orientation.

Even though entrepreneurial university is a promising research field, it has only attracted a very small number of studies (Todorovic et McNaughton, 2003). According to Todorovic and McNaughton (2003), these studies are infrequent or still in 'the childhood' stage. We conclude that there is a lack of knowledge regarding the university's entrepreneurial orientation, as well as the determination of its various aspects.

This highlights the importance of this article, which aims to emphasize on the university's contribution to foster entrepreneurship among students. Indeed, this article focuses on the necessity for universities to transform into entrepreneurial universities within an environment marked by profound changes, such as new teaching methods, the pressure of ICT, and the need for graduates to be employable.

In this article, we seek to answer the following research question: How is the university, and in particular, the Moroccan university, transforming into an entrepreneurial university, and what are its main theoretical and institutional levers identified in the literature?

This literature review aims to construct a theoretical framework on entrepreneurship and the entrepreneurial university, to synthesize the main models of the entrepreneurial university and to establish a conceptual model of the entrepreneurial university in Morocco. Furthermore, it seeks to complement previous work on the entrepreneurial university by examining the intersection of the concepts of "entrepreneurship," "entrepreneurial university," and "entrepreneurial ecosystem." Concerning the methodology of this literature review, the selection of works studied is carried out from the different databases (Scopus, Web of Science, Cairn and Google Scholar), over a defined period from 1980 to 2021.

In this article, we first present an overview of the definitions, approaches, and conceptions of entrepreneurship. Next, we describe the traditional missions of the university and present some empirical studies that have addressed entrepreneurship education, entrepreneurial support in higher education, and the relationship between the university and entrepreneurship. Then, we highlight the concept and theoretical models of the entrepreneurial university, and we analyze some empirical studies on the entrepreneurial university and its relationship with the entrepreneurial ecosystem. Finally, we conclude with some research works that have discussed the aspect of university spin-offs.

## **1. Entrepreneurship: definitions, approaches and conceptions**

### **1.1. Definitions of Entrepreneurship**

Several definitions of entrepreneurship have been given by authors from different disciplinary fields. The most common definitions are presented in the table below:

**Table n°1: Some definitions of entrepreneurship in literature**

<b>Author(s)</b>	<b>Definitions</b>
<b>Hisrich &amp; Peters (1991)</b>	Entrepreneurship is a dynamic process that involves the production of additional wealth.
<b>Filion (1997)</b>	The field of entrepreneurship studies entrepreneurs' activities, their characteristics, the economic & social effects of their behavior, and the forms of support provided to entrepreneurs to facilitate their entrepreneurial activity.
<b>Verstraete (2000)</b>	Entrepreneurship is a phenomenon too complex to be reduced to a simple definition, and its intelligibility requires modeling.
<b>Danjou (2002)</b>	Entrepreneurship is a field of research based on three levels of study: the entrepreneur, the action, and the entrepreneurial context.
<b>Verstraete &amp; Fayolle (2005)</b>	Entrepreneurship is an initiative decided by an individual to create or seize a business opportunity, the profit from which is not necessarily monetary.

Author(s)	Definitions
<b>Fortin cité par Rajhi (2011)</b>	Entrepreneurship reflects a mindset or attitude that drives an individual to start a new business, mobilize the necessary resources, and assume the risks of this adventure.
<b>Venkataraman (2019)</b>	Entrepreneurship is the scientific study of the process of discovering, evaluating, and exploiting opportunities to create new products and services.

## 1.2. Approaches of Entrepreneurship

### 1.2.1. Functional approach

The functional approach of entrepreneurship focuses on the results of entrepreneurship and gives attention to the actions of the entrepreneur and its role in creating economic systems (Fayolle, 2002). At this level, research activities focus on three paradigms: business opportunity, innovation, and value creation. Thus, this approach adheres to the Schumpeterian tradition, which considers the entrepreneur as an agent of change with a key role in economic growth.

### 1.2.2. Individual approach

McClelland (1998) is the first researcher representing this psychological approach. For him, the main characteristic of entrepreneurs is the need for achievement. This individual-centered approach, also called the attribute-based or behavioral approach, emerged in the 1970s. By identifying the entrepreneur's personality traits and relying on the contributions of psychology, the approach attempts to develop the entrepreneur's skills and personal characteristics.

### 1.2.3. Process approach

Developed from the 1990s, the process approach is a dynamic approach that focuses on evolutionary phenomena, and favors a broader vision of entrepreneurship compared to descriptive and behavioral approaches.

This method does not focus on the entrepreneur's personality traits, but rather on the activity in which the entrepreneur engages as part of the entrepreneurial process. In this regard, Fayolle (2002) notes that the study of processes is addressed in various works in the field of entrepreneurship.

### **1.3. Conceptions of entrepreneurship**

#### **1.3.1. Conception of entrepreneurship according to paradigms (Fayolle & Verstraete, 2005)**

According to Fayolle & Verstraete (2005), a paradigm represents a theoretical construction to which a significant part of researchers adheres, who share the viewpoint proposed by the paradigm.

These authors classified the different definitions of entrepreneurship proposed in the literature into four main paradigms: the opportunity paradigm, the organizational creation or emergence paradigm, the value creation paradigm, and the innovation paradigm.

As a result, and according to this conception, entrepreneurship allows for detecting opportunities, creating businesses, generating value, and innovating

#### **1.3.2. Conception of entrepreneurship according to registers and dimensions (Fayolle, 2003)**

Fayolle (2003) places entrepreneurship within registers and dimensions. This author's conception focuses on mindset and on presenting entrepreneurship as a field of training.

This author considers the concept of entrepreneurship to be related to three different registers: mindset, behaviors & situations, and it covers two dimensions: the individual and the collective.

## **2. University and entrepreneurship**

### **2.1. Traditional university missions**

Academic activities in Europe primarily concern education and research, and the equivalent American academic structure includes three components: research, teaching, and service. The last one enhances the other two. (Gareth, 1978).

Gareth (1978) considers that there are other specific activities, which are part of university functions, such as the development of botanical hybrids adapted to the educational needs of a predetermined developing country or the planning of accelerated courses for teacher training.

According to Meunier & Bienyamé (1986), the main objective of higher education in Eastern European countries is to develop scientifically social specialists, who are more aware of their social missions and obligations, with the aim of satisfying community expectations.

Furthermore, Meunier & Bienyamé (1986) believe that the university must meet the requirements of society by promoting the skills of various generations, to enable them to align effectively with the diverse economic, scientific, and technological needs, which facilitate their employability.

For a very long time, the rule governing higher education was 'knowledge above the golden calf' (Aghion & Cohen, 2004). Moreover, the university's mission was to improve knowledge and to train students in a particular field, while ignoring its responsibility to integrate them into the professional world (Schmitt & Bayad, 2003).

Generally, a university is an institution of higher education, studies, and researches, constituted through the association of various structures, forming a coherent administrative entity and having a defined legal status that can be public, private, or mixed.

## 2.2. Entrepreneurship training

Many authors believe that entrepreneurship education encourages young people to launch their businesses. The benefits it produces justify the growing interest in entrepreneurship training. Furthermore, according to some studies, there is a favorable relationship between the number of business creations and entrepreneurship education (Charney et Libecap, 2000 ; McMullan et Gillin, 1998 ; Garnier et Gasse, 1990 ; Lüthje et Franke, 2003 ; Fayolle et Fillion, 2006 ; Zammar et Abdelbaki, 2012 ; Boissin, 2014). Entrepreneurship education has been the subject of various scientific studies, some of which can be summarized in the table below:

**Table n°2: Some contributions on entrepreneurship training**

Authors(s)	Research results
<b>Kolvereid and Moen (1997) ; Fayolle (1999) ; Fayolle and Gailly (2009)</b>	Entrepreneurial training shapes entrepreneurial intentions and abilities, and acts as a catalyst for students to consider entrepreneurship as a desirable career choice.
<b>Toutain and al. (2014)</b>	The inclusion of an ecosystemic approach to entrepreneurship education allows for a better understanding of the role of the educational ecosystem in the functioning of entrepreneurship education systems. The entrepreneurial educational ecosystem is based on five axes related to educational program content, networks, learning spaces, the type of entrepreneurial culture produced, and preferred pedagogical approaches.
<b>Boissin (2014)</b>	Conception of an interactive, cumulative, and structured reference framework for the creation of an entrepreneurial path in higher education and the recognition of the « student-entrepreneur » status, enabling the training of students from bachelor's to doctorate levels in entrepreneurship. This framework is based on three axes: awareness raising at the bachelor's level « stimulating effect », specialization at the master's and doctoral levels to foster action, young people's support, and the allocation of the student-entrepreneur status.



Authors(s)	Research results
<b>Verzat &amp; Toutain (2014)</b>	<p>Entrepreneurial pedagogy enables learning from the experience of innovative projects linked to real problems, encourages, guides, and facilitates participants' taking of responsibility, cooperative group learning, and interaction with adults outside of school, and involves formative evaluation through reflective work and external recognition. This is a socio-constructivist-inspired pedagogy that is based on the promotion of metacognitive skills, and aims to develop the entrepreneurial spirit and entrepreneurial abilities.</p> <p>Moreover, learning entrepreneurship through an enterprising pedagogy positively impacts students' motivation and engagement in their studies by strengthening their self-confidence and entrepreneurial desirability. Furthermore, distance learning courses in entrepreneurship primarily foster knowledge acquisition rather than stimulating the entrepreneurial mindset.</p>
<b>Allard, and al. (2017)</b>	<p>Study of an entrepreneurship training program (EMPMO), whose associated approach is characterized by two key points as follows:</p> <ul style="list-style-type: none"> <li>- Integrated mixed training structure that prioritizes action to better introduce young people to professional integration.</li> <li>- Placing student empowerment at the heart of the support system, with the goal of developing agency, which in turn changes everyone's postures.</li> </ul> <p>This program will need to involve students much more actively than today, giving them the power to act by evaluating the system and participating in the management of the common good.</p>
<b>Albertini and al. (2018)</b>	<p>The implementation of an entrepreneurial university teaching project relies on five crucial factors: innovation and personalization of teaching programs, consultation and mobilization of university actors, adaptation of the pedagogical project to the local context, co-construction, and stimulation vectors.</p>
<b>Julien de Freyman (2018)</b>	<p>The development of educational systems for raising awareness of entrepreneurial behavior is a community responsibility that goes beyond the issue of social reaction to growing unemployment.</p>
<b>Yi &amp; Uyarra (2018)</b>	<p>The importance of identifying three management mechanisms for the academic entrepreneurial ecosystem model, for the purpose of improving the academic entrepreneurship effectiveness, which are as follows:</p> <p>The incentive mechanism, representing the driving force that could change the organizational framework, as well as individual research goals.</p>



Authors(s)	Research results
<b>Yi &amp; Uyarra (2018)</b>	The collaboration mechanism, which ensures the emergence of new entrepreneurial models and the creation of new businesses, by improving university governance and building entrepreneurial networks; The ability mechanism, an element of sustainable academic entrepreneurship, which is based on a combination of different entrepreneurial abilities within the university.
<b>Tavares and al. (2018)</b>	The importance of thinking about entrepreneurship training from an ecosystemic perspective. Educational practices move beyond the classic model, focusing on classrooms that incorporate student-led activities, mentorship programs, competitions, and more.

### 2.3. Entrepreneurial support

The university must operate in an entrepreneurial environment by mobilizing intrapreneurial attitudes at the level of its functions, its components, its culture, and its strategic decisions to foster entrepreneurship (Clark, 1998; Zaharia and Gilbert, 2005). Furthermore, other elements inherent to the external ecosystem are added to these elements related to the internal ecosystem of the university, such as university-industry partnerships with entrepreneurship incubation organizations.

Leyronas & Loup (2015) consider that the pre-incubation phase (from the idea's emergence to the first business model proposal), develops entrepreneurial skills beyond formal education and helps identify the necessary resources for a project. These skills will be inherently important for the student, whether or not he becomes an entrepreneur after training. In addition, Lacheguer & Bakhat (2024), observed that incubators play a crucial role in developing entrepreneurial skills, accessing financing and facilitating professional networks.

Furthermore, Leyronas & Loup (2015) found the key role of networks, both in the emergence of the project and in the mobilization of resources.

For his part, Gueguen (2015) emphasized that student entrepreneurs have unique profiles and needs that must be taken into account by the incubators working with them. These incubators are complementary to existing structures, and thus contribute to a region's entrepreneurial ecosystem.

Paivandi (2016) developed points for reflection concerning the support system in French higher education and the expected changes in the teacher-learner-knowledge relationship.

The creation of support mechanisms rests on the idea that there is a failure in the university that needs to be addressed (Annoot, 2014, p. 23). It involves taking charge of the student in situations where pedagogy is unable to meet integration and affiliation needs (Paivandi, 2016).

### 3. Relationship between university and entrepreneurship

Verstraete, T. (2000) considered that the university should consider four irreducible and inseparable dimensions when constructing concerted and coordinated actions through an "Entrepreneurship Center": knowledge valorization, awareness, incubation, and university-industry relations.

According to this author, the creation of the entrepreneurship center could occur in two stages: first, the adoption of an informal reflection structure aimed at providing a global offer adapted to the university (*pedagogical offerings, integration with existing structures, etc.*) and second, the creation of the new formal entity, following the vote of the university's board of directors. In order to strengthen the university-entrepreneurship relationship, Dia (2011) highlighted the current challenges faced by universities, which include promoting the integration of graduates, boosting research, and mobilizing additional resources.

The university's role is to promote entrepreneurship as a field of research and education (Fayolle, 2000). Zammar & Abdelbaki (2012) identified the actions decided by universities to stimulate the creation of innovative businesses. Furthermore, Paul (2012) highlighted the need to transform the university to act as a vector of entrepreneurial culture for economic promotion and to redefine its social function, which is inherently entrepreneurial. Consequently, a number of psychological and institutional constraints must be removed.

Morris et al. (2017) investigated the impact of the entrepreneurial university context on student entrepreneurship. The results revealed that students' participation in extracurricular activities scheduled at the university, and related to entrepreneurship is positively linked to their business creation activities.

Based on the evaluation of the status of 5 public higher education institutions, according to 6 aspects of the entrepreneurial university model (*governance & leadership, internationalization, knowledge exchange, human & financial resources, entrepreneurial education, and start-up support actions*), Papa & Demo (2018) proposed new practices to be implemented by these institutions to better face current and future challenges, namely:

- Entrepreneurship should be part of the institutional strategy.
- Entrepreneurship training for students and staff, with its pedagogy should be formally evaluated and encouraged.
- A formal system for incentives and rewards for excellence in teaching, research, business incubation, knowledge exchange, and research commercialization activities.

- Formal infrastructure to support technology and knowledge transfer, as well as created start-ups.
- A clear cooperation strategy with external stakeholders.
- Blended learning.

Muscio & Ramaciotti (2019) conducted research to study the factors affecting business creation by doctoral students, focusing on five factors: the entrepreneurial environment, the existence of university policy frameworks dedicated to entrepreneurship, the applicability of doctoral research to the industrial context, collaboration with the industrial sector during the doctoral period, and the integration of entrepreneurship courses into the doctoral program.

These authors concluded that the different programs and intervention points of universities can enhance sustainable entrepreneurship within ecosystems, and consequently, sustainable regional development.

#### **4. Entrepreneurial university**

##### **4.1. The emergence of the entrepreneurial university**

To analyze the contribution of universities to the growth of entrepreneurship, it is important to examine the evolution of their roles as higher education, research, and economic development institutions (Etzkowitz, 2003). In this context, Etzkowitz (1983) introduced the concept of the entrepreneurial university, to characterize universities that are currently essential and fundamental forces for local growth. Thus, the emergence of an entrepreneurial university leads to a reevaluation of traditional academic missions, and of the role that universities must now assume in socio-economic development.

Moreover, a university that implements entrepreneurial actions both in its internal and external environment (*at the level of its functions, the institution is assimilated to an entrepreneur and its members are business owners*) is qualified as an “entrepreneurial university” (Rajhi, 2011). Its members (students, employees, researchers and teachers) are academic entrepreneurs, meaning that they start or continue a new or existing activity, which depends administratively or financially on the university ecosystem (Jaziri, 2009).

According to Guenther and Wagner (2008), an entrepreneurial university is tasked with two missions: firstly, to integrate the entrepreneurial component into its core functions (entrepreneurship education and research valorization), and secondly, to foster an

entrepreneurial spirit among its students to enable them to engage with their communities and the outside world.

In addition to this, to become entrepreneurial a university must adopt an entrepreneurial orientation. Numerous studies have shown that organizations with an entrepreneurial orientation are more innovative and able of making decisions in risky contexts. This also applies to public institutions (Box, 1999; Morris and Jones, 1999, cited by Todorovic, 2003).

Furthermore, the research of Pane & Kumar (2015) has shown that the growing global trend of entrepreneurial activities emerging in large university institutions requires universities to reinvent their operational activities and engage in entrepreneurial activity to maintain their global competitiveness. On their side and referring to the theory of social networks, Fuster and al. (2019) propose that entrepreneurial universities, within a regional context, develop networks that support the entrepreneurial process.

In general terms, the entrepreneurial university constitutes a phase in the transformation of the university's missions. It involves adding a new mission of entrepreneurship to its classic functions of education and research. The objective is to review the structures and functions of universities, in order to adapt them to new socio-economic requirements.

## **4.2. Theoretical models of the entrepreneurial university**

### **4.2.1. Theoretical model of Guerrero, Kirby et Urbano (2006)**

Guerrero, Kirby, and Urbano (2006) developed a theoretical model categorizing formal and informal factors that can facilitate or hinder the entrepreneurial phenomenon in universities. These factors are:

- **Formal factors:** include university governance, organizational structure, startup support initiatives, and university entrepreneurship education programs.
- **Informal factors:** include the university's attitude toward entrepreneurship, entrepreneurship training methodology, and role models.
- **Macroeconomic and microeconomic factors related to the environment.**

The Guerrero, Kirby, and Urbano (2006) model is based on institutional economic theory, the analysis of theoretical models, and empirical studies of the creation and development of the entrepreneurial university.

#### 4.2.2. Theoretical model of Rajhi (2011)

Rajhi (2011) developed a theoretical model of entrepreneurship and entrepreneurial spirit within the university in the Tunisian context, through a hypothetical-inductive approach. This approach allowed for the improvement and enrichment of his conceptual model, by the addition of new variables as follows:

- The type of university impacts the development of entrepreneurship and the entrepreneurial spirit.
- The role of the university's head is crucial, as he is expected to become an entrepreneur.
- It is important to provide training for entrepreneurship educators and to use creative, playful, and ICT-based teaching methods for entrepreneurship education.
- Integration of communication among students and fostering their motivation.
- It is important to create partnerships with universities and society.

The originality of this model lies in the conjunction of factors relating to both internal organization (academic, para-academic, and institutional) and external aspects (university-business partnerships and relationships with business creation support structures) of the university that must operate with an entrepreneurial orientation.

#### 4.2.3. Theoretical model of Asli & El Manzani (2016)

Asli & El Manzani (2016) proposed a theoretical model of an entrepreneurial university in Morocco based on previous theoretical models, and taking into account the current state of the Moroccan university's entrepreneurial potential.

These authors examined the potential contribution of the entrepreneurial university in Morocco to the development of a regional entrepreneurial culture, through three main functions: teaching/consulting, research, and entrepreneurial activities, detailed as follows:

- **Teaching/consulting mission:** one of the most important missions of an entrepreneurial university is to provide entrepreneurship education. This education should not focus only on awareness but should also provide training, advice, and support to help regional entrepreneurs succeed and view entrepreneurship as a realistic career choice.
- **Research Mission:** the research mission within an entrepreneurial Moroccan university, must be a source of innovations for the local and national economy.
- **Entrepreneurial activities mission:** promoting an entrepreneurial culture within universities depends on each university's ability to operate with its environment and to innovate, to invent, therefore to be engaged in regional business.

By promoting individual and organizational entrepreneurial particularities, these missions enable the university to contribute to a regional evolution in attitudes towards entrepreneurship and the entrepreneur.

### 4.3. Empirical studies on the entrepreneurial university

The entrepreneurial university has been the subject of various scientific research, part of which can be summarized in the table below:

**Table n°3 : Some contributions on the entrepreneurial university**

Authors(s)	Research results
<b>Ibarra-Colado (2007)</b>	<p>This author classified the challenges arising from new emerging contexts, which universities face in 3 levels, without renouncing their historical roles as the main cultural institutions of society:</p> <ul style="list-style-type: none"> <li>- <b>Level 1:</b> the transformation of the meaning and content of the university's regime of autonomy and its legal principles.</li> <li>- <b>Level 2:</b> the emergence of governance as a strategic condition for achieving institutional objectives in a market-oriented context.</li> <li>- <b>Level 3:</b> the progressive transformation of the entrepreneurial university around new organizational arrangements, through which it tries to fulfill its functions efficiently and legitimately to meet market demands.</li> </ul>
<b>Meyers &amp; Pruthi (2011)</b>	<p>All actors in the ecosystem (<i>university, professors, students, and entrepreneurs</i>) have a role to play in creating entrepreneurial higher education institutions. These authors have proposed an action plan to create a cultural change and to develop the entrepreneurial university:</p> <ul style="list-style-type: none"> <li>- Recruitment of appropriate professors (academic entrepreneurs) engaged in activities beyond research and teaching, who are considering a hierarchical position at the university, and who have training and experience in the business world.</li> <li>- Developing links with industry: the development of a university-industry interface can take several forms (<i>sponsorship of research projects, business creation for the commercialization of research, financial help &amp; provision of consulting services for research laboratories and individual researchers</i>), to facilitate the patenting and exploitation of knowledge and research results.</li> <li>- Creating an appropriate reward and incentive structure, to motivate professors and students to network with business professionals, and to bridge the gap between academia and the industrial sector.</li> </ul>
<b>Teece and al. (2016)</b>	<p>The entrepreneurial university requires strong leadership with proactive management that should go beyond the university to the entrepreneurial ecosystem.</p>
<b>Sidrat &amp; Frikha (2018)</b>	<p>To become entrepreneurial, the university must face internal transformations. Furthermore, the management style and the type of university have a positive impact on the promotion of an entrepreneurial university.</p>

Authors(s)	Research results
<b>Dalmarco and al. (2018)</b>	Research results have revealed that certain dimensions ( <i>entrepreneurial perspective, external links, access to university resources, innovation &amp; research mechanisms</i> ), are important for promoting an entrepreneurial university, which foster the transfer of academic knowledge to the business world and, in consequence the socio-economic development.
<b>Sakapurnama, and al. (2019)</b>	The entrepreneurial university is a university that mobilizes natural incubators who provide a support structure for entrepreneurial professors and students. The trend of the knowledge economy highlights the need for university governance to transform the traditional university into an entrepreneurial one.
<b>Wakkee, and al. (2019)</b>	Facing poverty and pollution in local contexts can lead the entrepreneurial university to develop a vision of sustainability that becomes the engine for institutional change. In developing countries, entrepreneurial universities are drivers of sustainable change through education and awareness, rather than through traditional commercialization activities.
<b>Bezanilla and al. (2020)</b>	Leadership support and organizational structure are positively associated with training and research processes, which, in turn, appeared to be closely linked to the factors of promoting the entrepreneurial university, especially the university's mission and strategy.
<b>Alfaliha &amp; Raghouna (2020)</b>	To become an entrepreneurial university, we must integrate this new approach " <i>entrepreneurial orientation</i> ", to determine how to mobilize resources and factors towards this goal.

### 5. Relationship between university and the entrepreneurial ecosystem

The relationship between university and entrepreneurial ecosystem has been the subject of various scientific research, part of which can be synthesized in the table below:

**Table n°4: Some contributions on the relationship between university and the entrepreneurial ecosystem**

Authors(s)	Research results
<b>Bramwell &amp; Wolfe (2008)</b>	Beyond the generation of marketable knowledge and qualified scientific researchers, universities produce other knowledge transfer mechanisms by generating talent for the local economy, and by collaborating with local industry through the provision of technical support services.
<b>Lachmann (2010)</b>	Public policy can contribute to encourage businesses to invest in research and to promote collaborative forms between large companies and SMEs. Competitiveness clusters can also contribute to these domains in partnership with universities. Overall, the roles of public authorities are creating a favorable environment and mobilizing the necessary financial resources for promoting research and innovation.
<b>Reddy (2012)</b>	In many fields including engineering, university-industry collaboration remains limited. Furthermore, improved industry-university collaboration is not an effective solution for correcting all industrial flaws. With the exception of a few anecdotal examples, no study has shown that university-industry collaborations or policies have led to appreciable gains at the regional or national level.



Authors(s)	Research results
<b>Matt &amp; Schaeffer (2015)</b>	A hub university has two major characteristics, aligning with the 'knowledge factory' model, which differentiate it from a traditional university: developing the function of an innovation intermediary and multiplying relationships with actors in its economic ecosystem. Moreover, the evolution of coordination between the university and other stakeholders ( <i>research actors, financial intermediaries, business representatives, and political actors</i> ) contributes favorably to the development of entrepreneurship.
<b>Ranga and Etzkowitz (2015)</b>	Policies promoting universities' technology transfer ability are starting to incorporate an ecosystem perspective in some emerging countries.
<b>Sotarauta and Heinonen (2016)</b>	To achieve an analytical leverage on the Triple Helix model, it is important to focus the study on the general competencies required for the interaction between the main institutional spheres.
<b>Pinto (2017)</b>	Universities play a crucial role in generating scientific knowledge and public policies focused on knowledge dissemination, through a variety of innovation support mechanisms.
<b>Matt &amp; Schaeffer (2018)</b>	These authors defined two entrepreneurial models with distinct logics, one for professors and another for students, that should be interconnected in their development. This research revealed that universities that aim to foster student entrepreneurship must implement internal changes, moreover student entrepreneurship is more question of behavioral transformation than business creation.
<b>Matt &amp; Schaeffer (2018)</b>	The inclusion of student entrepreneurship in academic entrepreneurship offers strategic opportunities for universities. Furthermore, the vision of the university management team is a determinant of the university's ability to contribute to the transformation of the entrepreneurial ecosystem, because it relies on the desire to develop new coordination mechanisms in the university and in the ecosystem.
<b>Van Stijn, and al. (2018)</b>	Based on the literature, the three key mechanisms for understanding University Start-Up Interaction (USUI) are education, support for new businesses, and university-industry collaboration. The USUI process acts as a source for disseminating knowledge and fostering innovation, relying on intangible resources. Resources transferred by universities to startups mainly concern organization and product development, and to a lesser extent, market development.
<b>Kaklauskas and al. (2018)</b>	The development of a university-industry partnership assessment system (UIPS) is necessary for universities wishing to strengthen their relations with businesses. This approach is analyzed at three levels: micro-level ( <i>research and innovation performance, transfer &amp; absorption ability and technological development</i> ); meso-level ( <i>institutional arrangements, communication networks and local rules</i> ) and macro-level ( <i>supply and demand, regulations, financing, taxes, culture, traditions, market, politics, demography and technology</i> ).
<b>Ierapetritis (2019)</b>	Universities include in their missions not only the transfer of know-how but also the development of entrepreneurial culture, as well as the creation of venture capital, which contribute to the promotion of regional entrepreneurial ecosystems.

Authors(s)	Research results
<b>Ierapetritis (2019)</b>	Considering their contribution to the performance of education, advanced research, and knowledge networking, universities are recognized as institutions that foster the development of human resources, innovation, and entrepreneurship.
<b>Sánchez-Barrioluengo &amp; Benneworth (2019)</b>	This research is part of the third mission's analysis, which significantly contributes to regional and economic development, and in which universities are strongly invited to engage. University entrepreneurial engagement converges towards two distinct models: universities focus either on the outcomes of knowledge transfer or on regional economic development.
<b>Centobelli and al., (2019)</b>	A university's internal environment may have a greater impact on its entrepreneurial performance than its external environment.
<b>Wagner, and al., (2021)</b>	The university provides direct inputs such as spin-offs, entrepreneurial knowledge, and incubation activities within the entrepreneurial ecosystem, to influence the direction of research, learning, resource mobilization, and networking. Therefore, the university's support programs can enhance the entrepreneurial ecosystem through different intervention pathways.

## 6. University spin-off

Beyond education, other elements favor entrepreneurship within the internal and external environments of universities. In view of this, we highlight the importance of valuing the outputs of university research in the development of entrepreneurship (Clark, 1998).

Bares & Pirnay (2011) proposed actions for reforming support systems for university spin-offs created in research laboratories of European universities, such as: differentiating support based on project potential, increasing the critical mass of research resources to generate a sufficient number of high-potential projects, fostering a startup creation culture, and facing resistance to change.

Khademia & Ismaila (2013) showed that the commercialization of university research results is not an independent phenomenon, because certain crucial factors contribute to the success of this process, including: researchers' perception, the entrepreneurial team, networking, technological stage, funding, and market research.

According to Levie (2014), technology commercialization education depends on the university's entrepreneurial ecosystem. Pane & Kumar (2015) conclude that entrepreneurial leadership is a necessity for universities, given its contribution to improve the commercialization of university research.

François (2015) identified three forms of entrepreneurial dynamics in emerging university spin-off: the incremental dynamic, which advances the project gradually; the sequential dynamic,

which inhibits the project; and the disruptive dynamic, characterized by both obstacles and strong acceleration, leading to the spin-off emergence.

Furthermore, improving consistency, efficiency of practices and awareness are essential for universities to support and encourage the creation of university spin-offs. (François, 2015).

Social capital configurations vary at each phase of the entrepreneurial process. At the initiation stage, the social capital mobilized is primarily technological. Then, at the planning stage, entrepreneurs begin to mobilize financing relationships. After, at the start-up stage, social capital diversifies (*business relationships, financial resources, technological support, and coaching*). Finally, at the consolidation stage, observation of an evolution in the mobilization of business networks (Borges & Fillion, 2016).

Borges & Fillion (2016) recommended the creation of a support infrastructure by universities, to enable entrepreneurs to develop and expand their network, which was mainly technological before starting the entrepreneurial process. In addition, these authors suggested recruiting people with experience or connections in the business field, to support entrepreneurs in the technological field, and creating more activities oriented towards the development of entrepreneurial social capital.

Mirandaa, et al., (2017) consider that the intervention of public authorities to improve the entrepreneurial attitude of university students, would have a direct impact on their entrepreneurial intention and therefore on the number of spin-offs created.

University managers should be aware that the best way to promote entrepreneurial activity in their institutions is to create the conditions required to develop an entrepreneurial attitude among university professors. Indeed, despite the obstacles that exist when launching a spin-off, the entrepreneurial path can be an interesting alternative for research professors, as it complements and enriches their teaching and research work (Mirandaa, et al., 2017).

Riviezzo, et al. (2019), explored the relationship between the entrepreneurial orientation of university departments and their entrepreneurial performance, in terms of academic entrepreneurship outcomes (spin-offs) and knowledge transfer (patents). These authors found that the entrepreneurial orientation of the university departments studied is positively related to the number of spin-offs generated. This relationship is positively moderated by the age and size of the departments, the GDP per capita, and the country's R&D expenditure.

## Methodology

Concerning the review methodology, we selected 83 research papers by consulting databases (Scopus, Web of Science, Cairn and Google Scholar) covering the period from 1980 to 2021. The keywords used for the search were "entrepreneurship", "entrepreneurial university", "entrepreneurial training", "entrepreneurial support", "higher education", "academic entrepreneurship", "student entrepreneurship", "entrepreneurial ecosystem", "Morocco"..., and the selection logic was based mainly on systematic research.

## Results and Discussion

The results of this literature review are summarized around four key themes (entrepreneurial pedagogy, entrepreneurial support, relations with the ecosystem, and valorization mechanisms /spin-off), presented in the figure below:

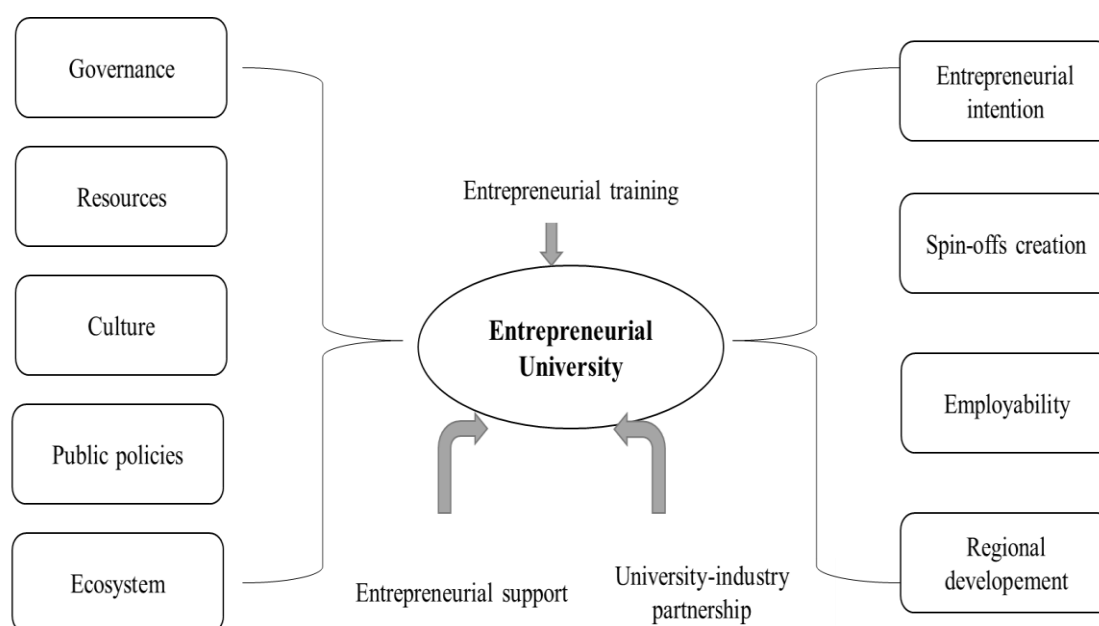
**Figure n°1: Summary of the literature review in 4 key themes**

<p><b>Entrepreneurial pedagogy</b> [Kolvereid &amp; Moen (1997); Fayolle (1999); Fayolle &amp; Gailly (2009); Boissin (2014); Julien de Freyman (2018); Yi &amp; Uyarra (2018)]</p> <ul style="list-style-type: none"> <li>-The entrepreneurial pedagogy based on learning from innovative projects, real-world problems, and group work, develops entrepreneurial intentions and skills.</li> <li>-The entrepreneurship education system should be based on three main components : awareness-raising, specialization, and support.</li> <li>-Entrepreneurial educational system is a community responsibility that requires mobilization of all actors in the ecosystem at university.</li> <li>-The effectiveness of academic entrepreneurship requires improved university governance and developed entrepreneurial networks.</li> </ul>	<p><b>Entrepreneurial support</b> [Clark (1998) ; Zaharia &amp; Gilbert (2005) ; Leyronas &amp; Loup (2015) ; Gueguen (2015)].</p> <ul style="list-style-type: none"> <li>-Entrepreneurial support complements existing programs and contributes to a region's entrepreneurial ecosystem.</li> <li>-Entrepreneurial support fosters the development of entrepreneurial skills beyond those acquired through formal education and helps determine the resources needed to implement the project.</li> <li>-Entrepreneurial support is formalized, in particular, through university-industry and university-business incubators partnerships.</li> </ul>
<p><b>Relations with the ecosystem</b> [Lachmann (2010) ; Matt &amp; Schaeffer (2015) ; Wagner, and al. (2021)].</p> <ul style="list-style-type: none"> <li>-The coordination between university, researchers, financial intermediaries, business representatives, and political actors contributes to the development of entrepreneurship.</li> <li>-University support programs can enhance the entrepreneurial ecosystem through different points of intervention (research, learning, resource mobilization, and networking).</li> <li>-Public authorities have a role to play in creating a favorable environment and mobilizing the financial resources necessary to promote research and innovation.</li> </ul>	<p><b>Valorization mechanisms/Spin-Offs</b> [Clark (1998) ; Pane &amp; Kumar (2015) ; François (2015) ; Mirandaa, and al., (2017) ; Riviezzo, and al. (2019)].</p> <ul style="list-style-type: none"> <li>-Universities' entrepreneurial orientation is positively related with the number of spin-offs generated.</li> <li>-Universities' entrepreneurial leadership contributes to the commercialization of university research.</li> <li>-Improving the coherence and effectiveness of practices, as well as raising awareness, are essential for universities to contribute to support the creation of spin-offs.</li> <li>-The existence of positive link between the commercialization of university research outputs and the development of entrepreneurship.</li> </ul>

### ➤ Conceptual model of the entrepreneurial university in Morocco

Based on the three theoretical models of the entrepreneurial university presented previously, we have established a conceptual model of the entrepreneurial university in Morocco, allowing us to identify the factors that contribute to the growth of this university, its main functions, as well as its role in regional development.

**Figure n°2: Conceptual model of the entrepreneurial university in Morocco**



### Research proposals:

Based on our analysis model, we formulate the following research propositions:

**Main research proposal:** The entrepreneurial university in Morocco would contribute to regional development.

### Secondary research proposals:

**P1:** Governance, resources, culture, public policies, and the ecosystem would be factors that lead to the development of the entrepreneurial university in Morocco.

**P2:** The three missions, namely training, entrepreneurial support, and university-industry partnerships, would contribute to the promotion of the entrepreneurial university in Morocco.

**P3:** Thanks to its main missions, the entrepreneurial university in Morocco would contribute to the development of entrepreneurial intentions, the creation of spin-offs, employability, and regional development.

## Conclusion

In an economic environment characterized by high rate of unemployment (especially among graduates) and the persistence of the informal economy, entrepreneurship offers significant wealth and job generation, which makes it a pillar of socio-economic development. Therefore, the growth of a culture and spirit of entrepreneurship among young people becomes a major challenge for Morocco.

As the primary producer of knowledge and expertise, universities are invited to adopt an entrepreneurial orientation, institutionalize entrepreneurial values, and face a number of challenges, including the development of an entrepreneurial culture, the professionalization of training, the stimulation of scientific research and creativity, and the mobilization of resources. The goal is to promote entrepreneurship, to enable young students to get involved in the economic sphere that guarantee their financial autonomy.

Collins, Hannon and Smith (2004) believe that the "value" of graduates today is related to their ability to manage and apply knowledge in action and within an entrepreneurial context, not only in the acquisition and in assimilation of knowledge. Therefore, universities must be developed as centers for competence, innovation, and creativity development.

This research work is located in this context, it analyzes the challenges and new missions of the Moroccan university in a risky and dynamic environment. In fact, the integration of entrepreneurship is a key factor in aligning universities in this new environment.

Indeed, entrepreneurship training must be transformed in the context of current changes, to meet the challenges related to the promotion of entrepreneurial motivations and the innovative spirit of the current generation. The objective is to provide these young people with the tools to solve problems in their country, and to transform them from job seekers into job creators or real drivers of development.

Furthermore, the university is invited, through the improvement of its learning methods, to enable students to promote their entrepreneurial aptitudes in order to ensure their professional integration. That is why, education is supposed to develop skills, but it must also make entrepreneurship an attractive and desirable career choice.

Moreover, the university should be more engaged in supporting students with entrepreneurial projects, by implementing measures to meet their needs, including mentorship and support from



specialists (academics and professionals), as well as facilitating their access to funding, business networks, and incubation spaces.

This requires the opening of the university to its ecosystem, establishing a university-business interaction, and communicating with its socio-economic environment to meet all social needs. In addition, the implicit role of the university in the national economy needs the involvement of public authorities in this process. In fact, the stimulation and support of entrepreneurial activities require a triangular partnership between the university ecosystem, businesses, and the public sector.

In this regard, it is crucial to elaborate a student entrepreneurship strategy involving higher education institutions, local authorities, and local entrepreneurship actors, to stimulate the entrepreneurial spirit of young people and facilitate their transition to entrepreneurial action.

In terms of the theoretical contributions of our work, it helps to enrich regional and global research related to the analysis of the relationship between entrepreneurship and the university (Schmitt, 2005), and the clarification of the terms “entrepreneurial university” and “entrepreneurial orientation of the university” in the Moroccan context.



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