

The role of university-enterprise collaboration in promoting entrepreneurship and startup creation

Le rôle de la collaboration université - entreprise dans la promotion de l'entrepreneuriat et la création de startups

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Résumé : Un tissu industriel diversifié et des sources innovantes de création de valeur sont essentiels pour cultiver la croissance économique. Dans cet article, nous soutenons qu'en promouvant l'innovation, la collaboration université-entreprise joue un rôle central dans la promotion de l'entrepreneuriat et la stimulation de la création de startups. Ce partenariat dynamique exploite les forces du monde universitaire et de l'industrie pour cultiver un environnement propice à l'innovation et à la prospérité économique. En outre, le rôle traditionnel des universités en tant que simples institutions d'enseignement et de recherche a été remis en question ces dernières années. Avec l'émergence de l'économie fondée sur la connaissance, l'université doit participer activement à la croissance sociale et économique. À travers cet article, nous démontrons comment la mise en place de mécanismes tels que les bureaux de liaison universitaires avec l'industrie (UILO) et les centres de développement de l'entrepreneuriat (CDE) pour diriger le flux de connaissances, d'innovation et d'expérience technique entre l'université et l'industrie peut contribuer à la création de petites entreprises et startups qui proposent des applications et des solutions pratiques à des problèmes du monde réel.

Mots clés : startup, entrepreneuriat, UILO, centres de développement de l'entrepreneuriat, innovation ouverte.

Abstract: A diversified industrial fabric and innovative sources of value creation are crucial to cultivate economic growth. In this paper we argue that by promoting innovation, the university-enterprise collaboration plays a pivotal role in fostering entrepreneurship and stimulating startup creation. This dynamic partnership leverages the strengths of both academia and industry to cultivate an environment conducive to innovation and economic prosperity. Moreover, the traditional role of universities as mere teaching and research institutions have been challenged in recent years. With the emergence of the knowledge-based economy, the university is required to be an active participant in achieving social and economic growth. Through this paper, we demonstrate how the installment of mechanisms such as University Industry Liaison Offices (UILO) and Entrepreneurship development centers (CDE) to lead the flow of knowledge, innovation and technical experience between the university and the industry can contribute to the creation of small enterprises and startups that offer practical applications and solutions to real-world problems.

Key words: startup, entrepreneurship, UILO, entrepreneurship development centers, open innovation.

Classification JEL : L29, O36.

1. Introduction

In recent years, there has been emphasis on entrepreneurship's and entrepreneurs' role to solve the world's problems and be the driver for economic growth (Audretsch, 2014). From this perspective, policies have been concerned with increasing awareness on the importance of business creation and redirecting graduates from the job market towards entrepreneurship (Obaji, 2014). Therefore, governmental policies focused on the pivotal role of the university in reinforcing the entrepreneurial intention amongst the youngest generations and providing training and education programs of practical significance for sustainable market competitiveness and wealth creation.

These initiatives have been reinforced in the era of the knowledge-based economy, where knowledge, information and technology overshadow the traditional factors of production such as natural resources and labor. With the exponential growth that the sector has known since the 90's, the stakes of economic prosperity are on the university's potential for innovation and creativity.

Additionally, a nurturing environment for entrepreneurship should be tailored to the specific needs and circumstances of the local entrepreneurial ecosystem (Audretsch et al., 2022). In this respect, universities should conduct thorough assessments of the local entrepreneurial landscape, including identifying key industries, existing startups, and potential areas of growth, and most importantly, establishing a strategic linkage between academic research and the industry (Tartari et al., 2014). Moreover, active engagement with local entrepreneurs, industry leaders, government officials, and community organizations enables the university to build relationships and gain insights into the specific needs and challenges faced by entrepreneurs in the region.

Aware of the pivotal role of the industry-university cooperation to boost the economic wheel and take up the challenge of the industry landscape diversification, the Algerian government, in addition of setting up a dedicated ministry for the knowledge economy, start-ups and micro-enterprises, a strategic pairing has been made between the latest and the ministry of higher education and scientific research. The twining of the two ministries was considered necessary to transform the products of academic research into marketable products. Moreover, recognizing the high stakes of startups and tech entrepreneurship for economic and social growth, the Algerian ministry of higher education have installed the 1275 ministerial resolution "*a degree a startup*" that entails a special mechanism to support startup and patent creation within the university for all bachelor, master, and doctorate students. An initiative that relies mainly on the direct coordination between the two ministries.

In this paper, drawing from secondary data, and a comprehensive literature review, we argue that the 1275 framework, through it's different mechanisms, namely, university Industry Liaison Offices (UILO) and Entrepreneurship development centers (CDE), in addition to the university incubator, can lead the flow of knowledge, innovation and technical experience between the university and the industry and contribute to the creation of small enterprises and startups that offer practical applications and solutions to real-world problems. Moreover, the university-enterprise partnership provides a rich ecosystem for potential entrepreneurs and offers students exposure to real industry challenges, enabling them to identify market gaps and develop viable business ideas.

2. The changing role of the university

The role of universities has been evolving over time to adapt to the same forces that shape economic growth and performance. Traditionally, universities were primarily focused on providing higher education and conducting research. However, in the age of knowledge, their role has

expanded in several ways (Duderstadt, 1999).

2.1. From entrepreneurship education to the entrepreneurial university

Concerned with employability of their graduates, universities now offer a wider range of programs and degrees to cater to a more diverse employment market, which includes online courses, vocational training, interdisciplinary studies, and lifelong learning (Prokou, 2008). Moreover, as entrepreneurship became one of the success factors of any economy, and as it became evident that educated entrepreneurs created more sustainable businesses, the university's involvement in the process of entrepreneurship education became relevant to the economic growth process (Tiberius & Weyland, 2023).

Entrepreneurship education is a specialized form of education that focuses on imparting knowledge, skills, and attitudes necessary to foster entrepreneurial thinking and behavior (Mei et al., 2020). It is designed to prepare individuals to identify opportunities, create innovative solutions, and effectively manage the risks and challenges associated with starting and running businesses. In this respect, entrepreneurial education, rather than equipping individuals with the skill and knowledge necessary to business creation, it is at the backbone of generating awareness for entrepreneurial and investment opportunities. It is a form of reorientation of the academic intellectual capital from the employment market to the business world by implementing a mindset for business startups (Wardana et al., 2020 ; Mukhtar et al., 2021).

Furthermore, universities in recent years have engaged in what they called the entrepreneurial university. The term "entrepreneurial university" refers to a higher education institution that actively engages in entrepreneurial activities and fosters an entrepreneurial culture both within its campus community and in its interactions with the broader society through the transfer of research results from the laboratory to the economic system (Feola et al., 2021). In the US, Senator Birch Bayh was aware of the importance of knowledge and technology transfer between the university and the industry when he intervened in congress saying that: "A wealth of scientific talent at American colleges and universities—talent responsible for the development of numerous innovative scientific breakthroughs each year—is going to waste as a result of bureaucratic red tape and illogical government regulation" (Introductory statement of Birch Bayh, September 13, 1978, cited in Audretsch, 2014, p. 5).

Entrepreneurial universities are characterized by their commitment to innovation, collaboration, and the integration of academic knowledge with real-world applications. Entrepreneurial universities prioritize research and innovation, often conducting cutting-edge research that has practical applications and commercial potential. They seek to transform research findings into tangible products, services, or technologies. These universities facilitate the transfer of technology and intellectual property from academic research to the commercial sector. According to Feola & al.(2021) Technology transfer can be categorized into different approaches.

- *Codified Transfer for Patent Exploitation* which focuses on utilizing and commercializing research outcomes that can be formalized and legally protected. It encompasses actions such as patenting innovations and subsequently licensing them to external companies. Licensing can be either exclusive or non-exclusive, leading to income generation for the university and further research advancement. Additionally, patents can be transferred to external companies or affiliated spin-off ventures, often involving the same researchers who conducted the initial research.
- *Tacit Transfer for Knowledge Asset Utilization*: This approach centers on harnessing the knowledge assets created by researchers. It involves strategies like establishing start-up companies and spin-offs, active participation in research projects, and offering consulting services. These mechanisms leverage the expertise and tacit knowledge of researchers to drive innovation and commercialization.

To operate this transfer of technology, a number of programs and mechanisms were created by the university, in response to institutional support for the dynamic partnership of university-industry.

2.2. Mechanisms at the service of the entrepreneurial university

The entrepreneurial university relies on a set of mechanisms and initiative to facilitate innovation, technology transfer and the development of an entrepreneurial ecosystem within the university. At the top of the list, Feola & al. (2021, p. 1790) refers to the academic spinoffs also known as university startups as: "a specific and economically powerful group of new technology-based firms founded by academic researchers with the aim to exploit technological knowledge that originated within a university". Besides the technological and financial support, these spinoffs require to operate, they highly rely on entrepreneurial education. Entrepreneurial courses of practical relevance prove to be positively related to the number of created academic spinoffs by a university (Sansone et al., 2021). Therefore, providing the academic community with programs and courses that teach academics the skills and mindset needed to start and manage businesses is crucial to the entrepreneurial university agenda.

The installment of university incubators is also one of the EU support mechanisms by providing resources, mentorship, and workspace to support and assist new startups (Wonglimpiyarat, 2016). These programs help nurture entrepreneurial talent and encourage the development of innovative businesses. As part of the entrepreneurial ecosystem, the UBI transforms university teachers into coaches and advisors and also tenants in the technology transfer process (Gozali et al., 2018). The thesis of the university incubator takes its origin in the US, while Silicon Valley startups started registering a high level of failure rate to lack of readiness and mastery of the business world. This led to the resolution that the best emerging business ideas will come from research and academia, and that it was time to rely on the academic world to develop a sustainable business activity (Strid, 2006).

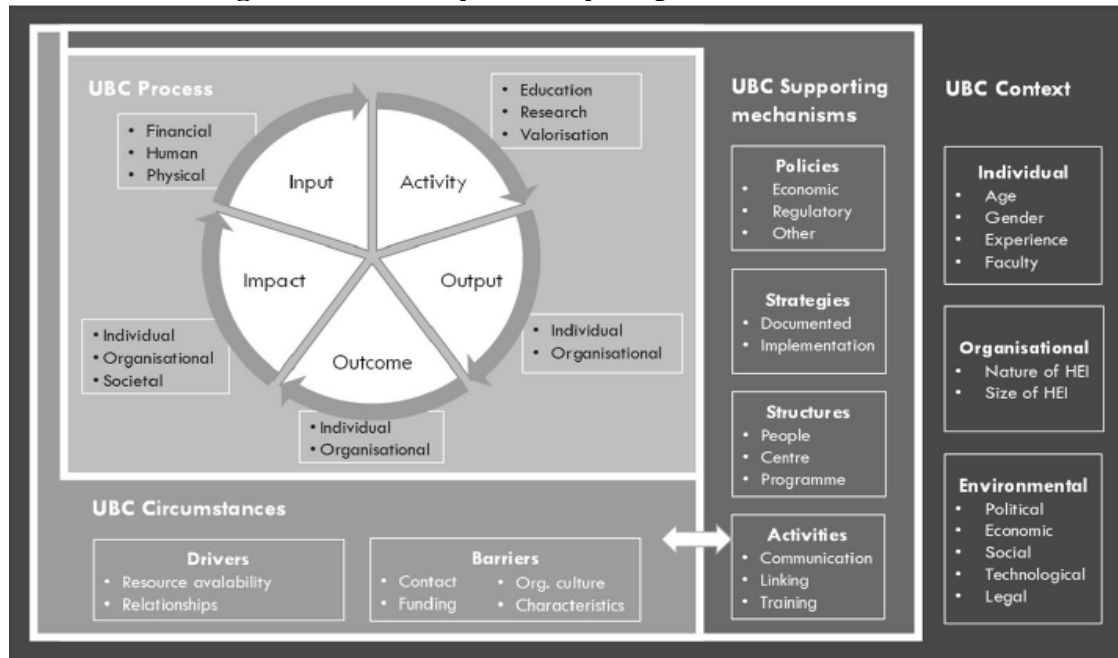
3. University-industry cooperation

The previously mentioned mechanisms would have no actual added value without industrial and institutional support. Entrepreneurial universities are actively engaged with industry partners, businesses, public institutions and startups. University industry cooperation refers to the flow of technical knowledge and resources between the two partners (Jones-Evans et al., 1999).

3.1. University-industry cooperation framework

With industries engaged in the process of open innovation (Bogers et al., 2018), there is a broad interest in the scientific knowledge that can be generated within universities. However, Galan-Muros & Davey stress out the importance of an across campus unified framework to manage this cooperation. The authors argue that individualized and fragmented initiatives can result in lack of efficiency and the waste of strategic opportunities (Galan-Muros & Davey, 2019).

Figure 1. university-industry cooperation framework



Source: Galan-Muros & Davey(2019) .

3.2. The university industry liaison office

A University-Industry Liaison Office (UILO) is a department or office within a university or academic institution that facilitates and manages interactions, partnerships, and collaborations between the university and various industries or businesses (Jones-Evans et al., 1999). Fassin summarizes the role of the UILO in three purposes: data and knowledge on the university's research potential, developing and facilitating partnerships among the university, business and industry, promoting "entrepreneurship" within the academic community (Fassin, 2000).

The UILO serves as a central point of contact to facilitate collaborations between researchers, faculty, and students within the university and industry partners. This can include research projects, technology transfer, and joint initiatives. Moreover, it plays a crucial role in transferring academic research, innovations, and intellectual property to industry partners for commercialization. This may involve licensing agreements, patent management, and technology commercialization efforts (Wills, 1981). Furthermore, supporting entrepreneurship initiatives and startups by connecting student or faculty entrepreneurs with industry mentors, investors, and resources.

4. The 1275 bylaw in Algeria – university-industry power partner

The 1275 resolution in Algeria can be considered as an efficient institutional strategy to boost the entrepreneurial intention and mindset among university student. By giving the business of startup and enterprise creation, an academic and practical framework at the same time, and providing the necessary mechanisms to facilitate the task.

The academic year of 2022-2023 in Algeria have witnessed a breakthrough in the nature and structure of academic degrees. The startup/ patent degree aims to force the academic community into the spectrum of entrepreneurship by engaging multidisciplinary teachers and students into a process of training, coaching, and supervising. However, this project wouldn't have been possible without the implication of the industry and the institutions responsible for facilitating and funding business ventures.

The 1275 resolution entails that upon registration, bachelor, master and doctorate final year

students engage in a series of training and courses taking from ideation, design thinking, business models creation, business planning, legal structure, intellectual and industrial property protection, prototyping, and digital marketing. This process is accompanied with the actual buildup of the project. Engaged with the realization of this initiative, the ministry of knowledge management was fully engaged with the process by providing training for trainers, technical support, and most importantly, giving special attention to the projects upon registration on the startup.dz platform.

Table 1. Algerian created mechanisms in response to the 1275 bylaw

Infrastructures	number
University incubators	94 / 17 labeled
Entrepreneurship development centers	84
AI houses	17
CATI	71

Source: Ahmed Mir, president of the national commission of innovation and university incubators follow-up.

Table 2. statistics of startups and SE creation stimulated by the 1275 bylaw

Number of projects	Labeled projects	SME	Patent requests
2243	234	734	212

Source: Ahmed Mir, president of the national commission of innovation and university incubators follow-up.

Over 2243 projects have been registered, with 234 attributed labels within months of dissertation defenses. These labeled projects will be provided with financial support attributed by the Algerian startup fund to enable scalability for these startups.

The UILO played a pivotal role in this framework. The first mission was to create a bridge between the local businesses and industry to give real-life problem-solving opportunities for project holders. Moreover, inviting startup owners and young entrepreneurs to present their success/failure stories to provide project holders with motivation and perspective. In addition to organizing events like challenges, competitions, university-business forums involving potential investors and stakeholders.

5. Conclusion

The 1275 can be the pure concretization of the triple helix model for the university-industry-government established by Etzkowitz (2002). It provides real evidence of Algerian orientation towards the entrepreneurial university in the age of the high-tech and knowledge economy. There is an emphasis on the importance of direct coordination between higher education and scientific research, in order to develop an entrepreneurial ecosystem that provides the atmosphere of entrepreneurship among universities, in addition to ensuring the necessary accompaniment for students with innovative projects in their entrepreneurial venture.

The entrepreneurial university nowadays relies on the symbiosis between the different mechanisms responsible for its success, and its ability to adapt and adopt strategies that foster economic growth, efficiency, and social prosperity. Therefore, the specific activities and responsibilities of a University-Industry Liaison Office may vary depending on the institution's institutional and legal environment, its goals, areas of expertise, and the surrounding industrial landscape. Overall, the UILO plays a critical role in fostering collaborations, promoting innovation, and driving economic growth through partnerships between academia and industry.

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