

The Strategy for Developing Entrepreneurial Skills Among Startup Project Holders: A Case Study of the Incubator of Mouloud Mammeri University of Tizi-Ouzou

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Abstract: This study examines the role of Algerian universities in supporting students who develop startup projects within the context of academic entrepreneurship. In response to economic and technological transformations, universities are no longer limited to knowledge transmission but have become key actors in socio-economic development. The research is based on the conceptual framework of the entrepreneurial ecosystem, university incubators, and entrepreneurial support, drawing on the 3P, 3M, and 3E theoretical models. An exploratory qualitative approach was adopted, combining a field survey of incubated students with an interview conducted with the management of the incubator at Mouloud Mammeri University of Tizi-Ouzou. The findings indicate that the university incubator plays a significant role in developing students' entrepreneurial and managerial skills. However, certain weaknesses remain, particularly in financial management, legal knowledge, and networking. The study highlights the need to strengthen and better structure university-based entrepreneurial support mechanisms in Algeria.

Keywords: University entrepreneurship, Startup projects, University incubators, Entrepreneurial support, Entrepreneurial ecosystem.

Introduction:

In an ever-evolving world shaped by the digital revolution, the energy transition, and the emergence of new economic paradigms, universities are increasingly called upon to redefine their traditional missions. The Algerian university, much like its counterparts worldwide, now faces a dual challenge: ensuring the transmission of knowledge while positioning itself as a key driver of economic and social development through innovation and entrepreneurship.

Entrepreneurship is now widely recognized as a fundamental engine of growth, innovation, and job creation (Drucker, 1985). It has also emerged within the academic sphere as a strategic lever. According to Fayolle and Gailly, the integration of entrepreneurship into higher education equips students with the skills, mindset, and confidence necessary to initiate and manage their own ventures (Fayolle, A., & Gailly, B., 2008). This evolution reflects a global trend in which universities are no longer merely institutions of instruction but have become active players within entrepreneurial ecosystems.

In this regard, several countries have implemented strategies that include support mechanisms such as incubators, entrepreneurship training programs, student innovation challenges, and partnerships with established companies (Gibb, 2002). The objective is to foster the emergence of start-ups and to transform innovative ideas into tangible economic projects. The “Triple Helix” model proposed by Etzkowitz and Leydesdorff (2000) highlights the importance of collaboration among universities, industry, and government in promoting innovation and business creation.

In Algeria, this growing awareness has been reflected in a strong commitment to integrating entrepreneurship into higher education. The establishment of an entrepreneurial culture within universities aims not only to encourage students to engage in entrepreneurial initiatives but also to enhance applied research and bridge the gap between academia and the economic reality. However, without a structured support system, innovative ideas often struggle to materialize into viable projects.

In this context, our study seeks to explore the support mechanisms available to student entrepreneurs and innovators within Algerian universities, taking as a case study the incubator of Mouloud Mammeri University in Tizi-Ouzou. The study is structured around several key objectives: defining the core concepts related to university entrepreneurship, presenting the entrepreneurial ecosystem in Algeria, identifying the success factors of university incubators, and finally, assessing the specific role these incubators play in supporting young student start-up founders.

The research problem can therefore be formulated as follows:

What is the contribution of the Algerian university to supporting students who develop start-up projects?

To address this question, we adopted a qualitative exploratory approach based on field research conducted within the university incubator of Tizi-Ouzou. This study aims to contribute to a better understanding of entrepreneurial dynamics within the Algerian university context and to propose recommendations for strengthening the role of universities as key actors in the knowledge-based economy.

1. Conceptual Framework: Start-ups and the University Entrepreneurial Ecosystem:

In order to clarify the theoretical foundations of this research and to structure the analysis, it is necessary to define the main concepts mobilized. The conceptual framework is based on the definition of key notions such as start-up, incubator, entrepreneurship, entrepreneurial ecosystem, entrepreneurial support, and entrepreneurial dynamics.

1.1 The Entrepreneurial Ecosystem and the Role of Incubators

The entrepreneurial ecosystem is the network of actors, resources, institutions, and interactions that support business creation and growth, bringing together entrepreneurs, investors, universities, authorities, and support structures to stimulate innovation and entrepreneurship.

- According to Stuart L. Hart, “An entrepreneurial ecosystem includes not only the traditional actors of entrepreneurship, but also external influences such as governments, universities, and social organizations, which contribute to creating an environment conducive to innovation” (Hart, 2005). Similarly, Isenberg, D. J., defines it as “a set of interdependent processes that bring together individuals, companies, investors, and institutions to foster the creation and growth of new ventures.” (Isenberg, 2011).

Within this ecosystem, certain structures play a crucial role in supporting project holders and strengthening the dynamics of innovation. Among them, business incubators occupy a strategic position.

An incubator is a support structure designed to accelerate and systematize the process of creating high-potential start-ups. It provides entrepreneurs with a set of resources, services, and expertise that foster the development and success of their ventures. These incubators serve as support platforms for innovative young enterprises, offering them a stimulating environment and the necessary tools to ensure their growth.

- According to the OECD, a business incubator is an organization that accelerates and systematizes the process of creating new enterprises by providing a range of support services, including office space, mentoring, training, and access to financing. (OCDE, 1997). Similarly, Paul Graham states: “An incubator is an organization that provides the necessary resources for the creation of startups, offering access to experts, investors, and tools to help them grow rapidly.” (Graham, 2004). According to William D. Bygrave and Andrew Zacharakis, an incubator is “an organization that accelerates and systematizes the process of creating viable businesses by providing entrepreneurs with a comprehensive set of resources and services, ranging from office space and administrative support to mentoring, coaching, access to financing, and networking opportunities.”. (William D. Bygrave et Andrew Zacharakis, 2004). An incubator is an integral part of the entrepreneurial ecosystem, providing structured support to entrepreneurs and facilitating interactions among economic and institutional actors, thereby driving innovation, development, and ecosystem competitiveness.

1-2 Definition of Entrepreneurship:

According to Joseph Schumpeter, “entrepreneurship is the process of “creative destruction” through which the entrepreneur innovates by introducing new products, processes, or markets, thereby transforming the economy” (Schumpeter, 1942). For William B. Gartner, “Entrepreneurship is the process by which individuals—either alone or in teams—identify an opportunity, pursue it, and mobilize the necessary resources to create a business” (Gartner, 1988).

Schumpeter highlights the entrepreneur’s role in innovation, while Gartner emphasizes venture creation through opportunity and resource mobilization. Entrepreneurship combines value creation with economic and social transformation, as the entrepreneur initiates and manages projects using necessary resources.

1-3 Definition of a Startup:

According to publications by the OECD (Organisation for Economic Co-operation and Development), “Startups are young, innovative companies with high growth potential, often operating in technological sectors, that require significant access to capital and expertise.”

Similarly, Paul Graham, co-founder of the renowned incubator Y Combinator, provides a concise and impactful definition: “A startup is a company designed to grow fast.” (Graham, 2004). According to Steve Blank (entrepreneur and Stanford lecturer), “A startup is a temporary organization in search of a scalable and repeatable business model.” (Steve Blank, Bob Dorf, 2020). A startup is a young, innovative company with high growth potential, driven by innovation—often technological—seeking a viable business model amid uncertainty and frequently requiring substantial funding.

1.4 The Entrepreneurial Dynamic:

The entrepreneurial dynamic refers to an evolutionary process through which an individual or a group gradually transforms an opportunity into a project, and then into an organization, through continuous interactions with the environment. It involves a co-evolution between the entrepreneur and the project, mobilizing learning, adaptation, and institutional as well as social resources. (Alain Fayolle & Sharon Wright, 2014).

1.5 Entrepreneurial Support:

“Entrepreneurial support refers to a structured process of assistance provided to the project founder to help them design, develop, and strengthen their initiative, through the mobilization of appropriate resources, guidance, and learning”. (Fayolle A. , 2004).

Entrepreneurial support provides project founders with training, mentoring, network access, funding assistance, and sometimes facilities like incubators or fab labs. In summary, university incubators offer a wide range of training and support services to help entrepreneurs succeed in launching and growing their startups, as presented in this table:

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Category	Skills
Entrepreneurial Skills	- Ability to identify business opportunities - Ability to develop a business vision - Ability to create and manage a business network - Ability to manage one’s own work
Managerial Skills	- Ability to develop a business strategy - Ability to coordinate and organize business activities - Ability to lead personnel - Ability to solve problems - Ability to control the activities of the business - Ability to negotiate
Technical, Management, and Sector-Specific Skills	- Ability to manage operations - Ability to manage finances - Ability to manage human resources - Ability to manage marketing and sales - Ability to comply with laws and government regulations

Source: Conceptual model proposed by Man, Lau, and Chan (2002) and adapted in the French-language literature by Lorrain, Belley, and Lussault (Université Metz-Nancy, 2004).

1.6 Integration of Theoretical Models in the Analysis of Entrepreneurial Support

Entrepreneurial support is a complex and multidimensional process that involves constant interaction between the entrepreneur, the project, and the environment in which it evolves. To fully capture its richness, it is relevant to combine insights from several theoretical models—the 3P model (Lévy-Tadjine & Paturel, 2006), the 3M model (Schmitt, 2018), and the 3E model (Paturel, 1997). Each of these models offers a specific perspective on the

entrepreneurial process, and their integration makes it possible to build a holistic vision of entrepreneurial support.

➤ The 3P Model (LEVY-TADJINE, PATUREL, 2006) is a tool that describes and highlights the entrepreneurial support relationship by emphasizing the different actors involved. It consists of three main elements:

-The Projected (Le Porté): This is the object of the entrepreneurial project—the idea, concept, product, or service that the entrepreneur seeks to develop. It has its own identity, needs, and trajectory.

-The Entrepreneur (Le Porteur): This is the person who initiates and drives the idea or innovation. The entrepreneur plays a central role in the development of the venture and bears responsibility for the project's success or failure.

-The Supporter (Le Portant): These are the individuals or institutions that support the entrepreneur. They can provide financial, logistical, or intellectual assistance. The Supporter represents the support mechanism (organization, advisor, mentor, network, etc.).

This model emphasizes that support is not limited to a dyad of mentor-entrepreneur but is influenced by a broader network of actors.

➤ The 3M Model (SCHMITT, 2018) offers a complementary perspective by focusing on the constitutive dimensions of the entrepreneurial process:

-Me (the entrepreneur): As an individual with personal characteristics.

-My project: Encompassing all the artifacts created by the entrepreneur.

-My ecosystem: Representing the stakeholders and interactions surrounding the entrepreneur.

This model stresses the importance of the ecosystem and relational dynamics in the entrepreneurial process.

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➤ The 3E Model (PATUREL, 1997) proposes a systemic approach to entrepreneurship, considering the interaction between:

-The Entrepreneur (E1): With aspirations and motivations.

-The Enterprise (E2): Representing all the resources necessary for the project.

-The Environment (E3): Encompassing external factors influencing the project.

This model highlights that entrepreneurial success depends on the balance and coherence among these three elements.

➤ **The Intersection of the Three Models: Toward an Integrated Vision**

The articulation of the 3P, 3M, and 3E models allows for an integrated understanding of the entrepreneurial process, highlighting three fundamental dimensions: the entrepreneur, the project, and the environment. Their intersection shows that venture creation is not linear but emerges from dynamic interactions between the individual, the entrepreneurial idea, and the surrounding ecosystem.

-The Human Factor: The Entrepreneur

All three models place the entrepreneur at the center. In the 3P model, this is the Bearer (P2); in the 3M model, Me (M1); and in the 3E model, the Entrepreneur (E1). These perspectives emphasize that venture creation relies on personal characteristics such as skills, motivation, innovation capacity, and risk-taking. Entrepreneurial support should therefore strengthen the project leader's competencies, confidence, and decision-making ability.

-The Organizational Factor: The Entrepreneurial Project

The second dimension concerns the project itself. In the 3P model, this is the Carried (P1); in the 3M model, My Project (M2); and in the 3E model, the Enterprise (E2). These intersecting views illustrate the transformation of an idea into a structured, value-creating enterprise.

Support helps the entrepreneur clarify the idea, structure the business model, and ensure project viability.

-The Contextual Factor: Environment and Ecosystem

The third dimension concerns the entrepreneurial ecosystem. In the 3P model, it is the Supporting Structure (P3); in the 3M model, My Ecosystem (M3); and in the 3E model, the Environment (E3). This intersection underscores the importance of resources—financing, networks, training, and infrastructures—provided by incubators, universities, public agencies, banks, and investors to support project development.

A Systemic and Dynamic Approach

Integrating the 3P, 3M, and 3E models highlights that venture creation depends on continuous interaction among the entrepreneur, the project, and the environment. This approach is systemic, revealing interdependencies among actors and structures, and dynamic, reflecting the evolving needs of both the entrepreneur and the project. Support thus enhances competencies at two levels: strengthening the project holder's skills (entrepreneurial, managerial, decision-making) and improving the project's structure, feasibility, and economic coherence, simultaneously reinforcing the entrepreneur and their initiative.

2. Entrepreneurship in the University Environment and the Academic Entrepreneurial Ecosystem:

2.1 Role and Objectives:

By fostering the courage to innovate, universities play a crucial role in shaping the talents of tomorrow. They help students transform their visions into concrete projects, encouraging initiative and imagination. Universities do not merely instruct; they prepare future change-makers who will drive innovation and economic growth.

The teaching of entrepreneurship in universities is vital for promoting novelty and creating an environment conducive to the emergence of startups, small, and medium-sized enterprises. By developing an entrepreneurial mindset among students, universities cultivate a dynamic entrepreneurial culture, which is a key driver of economic growth.

This training provides future entrepreneurs with both theoretical and practical tools, as well as a proactive mindset. By supporting SMEs, which are engines of employment and the economy, entrepreneurial education becomes a catalyst for sustainable progress and innovation, thereby enhancing the performance of modern economies.

According to numerous scholars, such as Béchar J-P (2000), Fayolle A (2000), and Verstraet T (2000), entrepreneurship can indeed be taught academically and practically, similar to other disciplines within management sciences. This approach allows learning to be structured around theories and methods that foster creativity and innovation. Katz J-A (1990) states, "Entrepreneurship education is one of the most evident forms of preparing individuals to engage in business creation." Katz highlights that entrepreneurship education equips individuals to create enterprises. By including entrepreneurship modules in university curricula, students gain the skills to develop projects, make informed decisions, and navigate the business world. Thus, universities play a key role in promoting entrepreneurship as a viable career path and supporting economic development.

- Entrepreneurial Support within the Academic Ecosystem:

As a practice, a field of research, and an area of teaching, entrepreneurship requires tailored training, which universities are well-positioned to provide. Such training addresses the specific needs of future entrepreneurs, often more effectively than support mechanisms that may lack academic depth. It is this ability to combine theory and practice that gives universities a competitive advantage in promoting entrepreneurship, by preparing individuals to meet market challenges and drive innovation. (Tounès-Azzedine, 2003).

Presentation of the Three Levels of University Intervention in Entrepreneurship Education:

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Level of Intervention	Objective	Actions	Goals
1. Awareness (or Initiation) Level	To understand the importance of entrepreneurship and to encourage an entrepreneurial mindset.	Workshops, conferences, introductory courses..	Reflection on one's ability to undertake initiatives and take risks.
2. Training Level	To acquire both theoretical and practical knowledge of business management skills (finance, marketing, strategy, human resources, etc.).	Case studies, internships, practical projects (business plans, simulations).	To equip students with the necessary skills to successfully create or manage a business.
3. Support (or Accompaniment) Level	To provide personalized support in the creation or management of a business.	Incubators, tutors, mentors, individual consultations, specialized training, networking.	To strengthen confidence and increase the likelihood of entrepreneurial success.

Source: Prepared by the authors, adapted from Fayolle, A. (2001) and Gibb, A. (2002).

This table provides a relevant and well-structured framework for understanding the key stages of entrepreneurial development. It highlights the importance of a progressive and multidimensional approach to encouraging and supporting the creation and growth of new ventures. It clearly and progressively presents the three essential levels involved in the development of entrepreneurial culture and competencies, particularly within an educational environment such as the university.

2.2 The Role of the University:

The university is more than a training center; it is a strategic driver of economic and social transformation. Beyond teaching and awarding degrees, it fosters entrepreneurship, turning ideas into projects and projects into growth. Through incubators, research labs, business partnerships, and entrepreneurship programs, it cultivates innovation, initiative, and creativity, strengthening economic competitiveness and social resilience. By linking research, innovation, and enterprise, the university plays a central role in building a sustainable, inclusive, and forward-looking society.

2.3 The University's Relationship with Its Socio-Economic Environment :

The university plays a central and proactive role within its environment in stimulating the creation of startups. It acts simultaneously as a source of talent, ideas, and innovations; a provider of support and guidance; an interface with the broader ecosystem; and a driver of economic and social development. The quality of the relationship between the university and its environment is a key determinant of the success of entrepreneurial initiatives emerging from the academic sphere.

-According to Clark (1998) the concept of the entrepreneurial university refers to an institution that fosters a culture of innovation, restructures its internal activities to encourage initiative, and collaborates actively with economic actors. For Clark, this orientation is crucial for transforming the university into fertile ground for startup creation. (Clark, 1998)

- Similarly, the Triple Helix model developed by Etzkowitz and Leydesdorff (2000), positions the university as a central actor interacting dynamically with industry and government. The

university is no longer limited to teaching and research; it now actively participates in the creation of innovative enterprises.(Etzkowitz, H. & Leydesdorff, L, 2000)

This model highlights the emergence of entrepreneurial universities capable of generating technological spin-offs and explains how innovation arises from the interaction among three key actors: The University, Industry (Enterprises), Government

The roles of these three actors within the Triple Helix model can be summarized in the following table:

Actor	Traditional Role	New Role in the Triple Helix
University	Education & research	Economic actor, startup creator, source of innovation
Industry	Production & employment	Research partner, financier, technology user
Government	Regulation & public funding	Facilitator, innovation policy maker, supporter of incubators

Source: ared by the authors (adapted from the Triple Helix model of Etzkowitz and Leydesdorff, 2000).

2.4 Main Objectives of Entrepreneurial Support:

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- According to Chabaud et Sammut (2007), the objective is to enable the entrepreneur to develop their entrepreneurial skills, reduce the uncertainties associated with business creation, and foster resilience in the face of entrepreneurial challenges. (Chabaud. D, & Sammut. S, 2007)
- According to Verzat, Gaujard, and François (2010), the aim is to cultivate a reflective mindset in the project owner, support the emergence of an entrepreneurial identity, and enable the gradual empowerment of the entrepreneur. (Verzat. C, Gaujard. C, & François. V, 2010)
- According to the 3P model (LEVY-TADJINE T. PATUREL R, 2006), entrepreneurial support seeks to harmoniously integrate the entrepreneur, the project, and the support framework. It provides guidance for both the individual and their project within a co-constructive process, offering a secure and adaptable framework. Its primary objective is to help the entrepreneur structure a viable project, develop their skills, and mobilize necessary resources, while simultaneously strengthening their entrepreneurial posture. Entrepreneurial support thus becomes a process of learning and empowerment, where the entrepreneur learns to grow their project while developing themselves as an entrepreneur.

3. Research Context and Methodological Framework:

Our investigation is rooted in a specific environment, the understanding of which is crucial for interpreting the results of our research. The following elements describe the framework within which our study was conducted, detailing the research context and outlining the methodological considerations that guided our work.

3.1 Research Context:

Our research is situated within the entrepreneurial ecosystem of Algerian universities, a rapidly evolving domain of strategic importance for the country's economic development. Algerian higher education institutions, as key actors, strive to stimulate entrepreneurship through education, research, and support for student initiatives. Although efforts to integrate entrepreneurship into academic curricula are increasingly visible, with the introduction of

specialized modules and dedicated Master's programs, this provision remains limited at the national level. The crucial role of academic staff, acting both as educators and mentors for student projects, also constitutes a fundamental aspect of this research context.

3.1.1 Supporting Structures: The Case of the University of Tizi Ouzou Incubator

The Ministerial Decree No. 1275 of September 27, 2022, supplemented by Decree No. 008, forms the foundation of the Algerian initiative “One Degree – One Startup / One Degree – One Patent”, which aims to integrate entrepreneurship and innovation at the heart of the university system. This mechanism allows students to replace their final-year thesis with a startup creation project or an invention patent, supervised by an academic staff member and a professional mentor, and evaluated by a university committee that awards the “Innovative Project” label. Decree No. 008 expanded this framework to all disciplines, including the humanities and social sciences, and strengthened coordination between universities, incubators, and technology transfer structures. Together, these regulations reflect the authorities’ intention to transform universities into engines of value creation and skilled employment, promoting the emergence of a startup ecosystem rooted in research and higher education. This pairing of decrees sustainably engages students in a process of innovation, autonomy, and responsibility.

In line with national strategic orientations, particularly those driven by Ministerial Decree No. 1275 of December 27, 2022, Algerian universities have seen the emergence of structures supporting entrepreneurship. Among these, university incubators play a leading role by providing a favorable environment for business creation and innovation for students and recent graduates. These entities aim to offer personalized support, collaborative workspaces, specialized training, and sometimes access to funding.

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As an illustrative example and specific point of focus for our study, the Incubator of Mouloud Mammeri University of Tizi Ouzou (UMMTO) serves as a privileged observation site. Its primary mission is to facilitate the creation and development of innovative enterprises in the region by providing a supportive environment and resources for young talent to transform their ideas into viable projects. Selecting this research site allows for a concrete examination of the dynamics of incubation and entrepreneurial support within an Algerian university institution.

The Incubator of Mouloud Mammeri University of Tizi-Ouzou is a space designed to enable students to become informed, express themselves, and engage actively with their business ideas. In May 2024, it was awarded the “Incubator Label” by the Ministry of Knowledge, Startups, and Micro-Enterprises.

Once interested in business creation, students and graduates can benefit from training sessions organized and delivered by the incubator’s trainers, who teach them how to think and act as entrepreneurs. The trainers and coaches provide guidance to student project holders, supporting them from the initial idea stage through to the establishment of their ventures after graduation.

3.1.2 Entrepreneurship in Algerian Universities:

Algerian higher education institutions play a key role in fostering entrepreneurship, acting through training, research, and support for student initiatives. Although efforts toward integration have been made, their overall impact remains moderate due to several limiting factors. The following outlines the fundamental aspects of entrepreneurship within Algerian universities.

A. Integration of Entrepreneurship into Academic Curricula::

Although entrepreneurship is a relatively recent field within the Algerian university landscape, an increasing number of institutions are introducing modules, training programs, and

specialized courses. Courses in management, innovation, and economics, as well as master's programs in entrepreneurship or innovation management, are now offered in certain universities. However, the overall availability of such programs remains limited on a national scale. The key challenge lies in expanding both their number and influence to instill an entrepreneurial mindset among students—not only within economics-related disciplines but also in the sciences and technologies, where innovation and entrepreneurship are particularly strategic. As highlighted by (Bersouli F. & Makhloof A, 2025), entrepreneurship education in Algerian universities remains at an embryonic stage. Although several institutions have introduced dedicated programs, the current provision is insufficient to establish a genuine entrepreneurial culture. The authors emphasize the need to incorporate active pedagogical approaches—such as project-based learning, incubators, and idea competitions—and to generalize these initiatives across all disciplines, particularly in scientific and technological fields, where innovation represents a strategic lever for national competitiveness.

- Role of Teachers and Researchers:

University teachers and researchers in Algeria play a crucial role in promoting entrepreneurship—not only as educators but also as mentors guiding student projects. Some researchers, particularly in technological and scientific fields, are directly involved in business creation projects in collaboration with students or entrepreneurs. These initiatives can occasionally lead to the development of technological startups or commercially viable patents.

- Incubators and Support Structures for University Entrepreneurship:

University Incubators:

Aligned with national strategic orientations, particularly Ministerial Decree No. 1275 of 27 December 2022, Algerian universities play a key role in promoting entrepreneurship through education, research, and support for student initiatives. Incubators and support structures provide personalized guidance, collaborative workspaces, specialized training, and sometimes access to funding. For instance, the Incubator of the University of Tizi Ouzou facilitates the creation and development of innovative businesses, helping young talents turn their ideas into viable projects.

Entrepreneurship Development Centers:

Entrepreneurship development centers support and promote entrepreneurship, especially among students and young innovators, by offering training, guidance, and post-creation support. They stimulate business creation, innovation, and employability and are often linked to universities, incubators, or public and private organizations. In Algeria, initiatives by the Ministry of Higher Education and Scientific Research have established such centers, including remote centers, to foster entrepreneurial culture, innovation, and practical skills for business creation.

These initiatives are part of a broader strategy to promote university entrepreneurship in Algeria. As noted by (Benhabib, 2020), such mechanisms are essential for fostering innovation and self-employment within the academic community.

Entrepreneurial Competitions and Events:

Business creation competitions and hackathons are gaining increasing popularity within Algerian universities. These initiatives aim to encourage students to develop concrete projects, cultivate managerial skills, and foster creativity.

For example, the National Entrepreneurship and Innovation Competition, supported by the Ministry of Higher Education and Scientific Research, rewards the most outstanding university-based entrepreneurial projects.

3.1.3 Challenges of University-Based Entrepreneurship in Algeria:

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Despite the numerous initiatives undertaken in recent years, several challenges persist and hinder the full development of entrepreneurship within Algerian universities. These obstacles stem from cultural, financial, legal, and structural factors, thereby limiting the overall impact of the mechanisms implemented.

A. Lack of Entrepreneurial Culture:

Entrepreneurship is still perceived by many as a risky endeavor, particularly in a context where careers in the public sector or state-owned enterprises remain more attractive. The majority of young graduates, despite their academic training, tend to prioritize seeking salaried employment over creating their own businesses. Several studies have highlighted this reality: according to (Belaabed, 2021), Algeria suffers from a significant deficit in entrepreneurial culture, largely due to insufficient training in innovation and entrepreneurial mindset. Similarly, (Kamel Ould Ferroukh et Makhoul Louni, 2024) emphasize that entrepreneurial culture remains weak within Algerian universities, owing to pedagogical and structural challenges that hinder the dissemination of initiative and entrepreneurship within higher education institutions.

B. Limited Access to Funding:

The lack of access to adequate financing constitutes a major barrier to business creation in Algeria. Although mechanisms such as the National Fund for Assistance in Business Creation (FONAPEC) and ANSEJ (now NESDA) exist, the process of obtaining funding remains complex and insufficiently accessible for many young entrepreneurs, despite the simplification of procedures under the new system.

According to (Ould Ferroukh. M, & Boudjemaa. A, 2022), public mechanisms supporting business creation remain characterized by administrative delays and limited alignment with the actual needs of young project holders. Banking support for youth-led projects is also restricted due to risk aversion and the lack of adequate guarantee mechanisms (Bouzidi. M, 2021). Furthermore, (Benhabib. R, & Lalaoui. S, 2020) highlight that financial structures dedicated to entrepreneurship remain underdeveloped, which limits the transformation of entrepreneurial ideas into viable businesses.

C. Complex Legal and Administrative Framework:

Administrative procedures for establishing a business can be lengthy and burdensome, discouraging many young entrepreneurs. The regulatory environment is still marked by bureaucratic inefficiencies, which slow down the establishment and development of entrepreneurial initiatives.

According to (Kebir. H, & Bessaoud. A, 2021), the complexity of the legal framework constitutes a major obstacle to entrepreneurial initiative, particularly due to delays in registration processes and the numerous requirements imposed on new entrepreneurs. This excessive bureaucracy undermines the competitiveness and responsiveness of young enterprises (Ferroukhi. S, & Mebarki. T, 2020). De plus Moreover, (Aït Ali. L, 2022) highlights those public policies aimed at simplification remain insufficiently effective in practice, despite the stated commitment to modernization by the institutions.

D. Lack of Infrastructure and Post-Creation Support:

Although incubators exist, their hosting capacities and the resources they provide remain limited. Furthermore, there is a shortage of structures offering long-term support, which is essential for startups in their growth phase. Many young entrepreneurs find themselves without guidance after launching their projects, thereby jeopardizing their long-term sustainability.

According to (Djenane. F, Khelifi. , 2021), support mechanisms in Algeria suffer from a lack of material and human resources, which limits their real impact on entrepreneurial development.

University incubators, in particular, are still at an experimental stage and struggle to provide sustained follow-up (Messaoudi. A, & Boudiaf. R, 2022). Furthermore, (Ouali, M., & Hamidi, K, 2023) note that the absence of professional networks and post-creation evaluation mechanisms exacerbates the fragility of young enterprises, which often face isolation and a lack of growth-oriented financing.

3.2 Research Methodology:

3.2.1 Research Objective:

The primary objective of this study is to analyze the effectiveness of the entrepreneurial support provided within the university incubator, through the acquisition of entrepreneurial skills by students carrying startup projects and innovative initiatives.

3.2.2 Methodological Approach:

To assess the effectiveness of the entrepreneurial support and training offered within the Tizi-Ouzou university incubator, we adopted a mixed-methods research approach characterized by the predominance of qualitative analysis within an exploratory framework., based on fieldwork conducted directly within the incubator, enables an in-depth exploration of the perceptions, experiences, and feedback of the beneficiaries of the support provided. It also offers the opportunity to capture the institutional perspective conveyed by the incubator's management, which is a key element in understanding the implemented strategies and their impacts.

This study therefore aims to contribute to a nuanced understanding of entrepreneurial dynamics within the Algerian university context and to propose concrete avenues for improvement in order to strengthen the role of the university as a central actor in the knowledge economy.

3.2.3 Target Population and Sampling:

For the purpose of this study, the questionnaire was addressed to all student project holders enrolled in the incubator of Mouloud Mammeri University of Tizi-Ouzou. The objective was to collect their perceptions and experiences regarding the entrepreneurial support mechanisms implemented within this structure.

Data collection was carried out through an online questionnaire administered via the Google Forms platform. The link to the form was sent by email to all concerned students. In total, 128 students were invited to participate in the survey. Despite several reminders sent to encourage participation, 52 complete responses were collected. These responses therefore constitute the final sample used for the analysis.

In order to enrich the analysis and complement the data collected from the students, the study also incorporates the perspective of the incubator's director, obtained through open-ended interviews. Her testimony is particularly valuable as she occupies a central role in the design, implementation, and strategic orientation of the entrepreneurial support mechanisms within the incubator. Integrating this perspective thus provides an additional institutional insight into the support practices developed in this university context.

3.2.4 Data Collection Tools:

To gather the information necessary for this exploratory qualitative study, we employed a combination of complementary tools: a semi-structured questionnaire administered to incubated students and an open-ended interview conducted with the director of the incubator.

A. Semi-Structured Questionnaire:

A semi-structured questionnaire was designed to survey students incubated within the Mouloud Mammeri University of Tizi-Ouzou (UMMTO) incubator. The target population included project holders of startups and innovative initiatives who received support during the 2023–2024 period. This questionnaire was distributed electronically via the students' email

addresses. Its content, primarily composed of open-ended questions, aimed to explore several crucial dimensions of their experience:

- Details of the entrepreneurial support process they received.
- Skills acquired (technical, managerial, entrepreneurial, interpersonal, etc.) during this support.
- Their perception of the quality and relevance of the support provided.
- Challenges or difficulties encountered throughout their time in the incubator.
- Suggestions for improvements to optimize the services offered

B. Open-Ended Interview with the Incubator Director:

In addition to the questionnaire, an open-ended interview was conducted with the director of the incubator. This interview pursued several strategic objectives:

- To obtain a comprehensive overview of the incubator's activities and missions.
- To assess the results and impacts observed by the management regarding entrepreneurial support.
- To identify future development perspectives and strategic directions for the incubator.

The interview was conducted both face-to-face and via social media platforms, and it was fully transcribed to facilitate an in-depth qualitative analysis.

3.2.5 Data Analysis Method:

The data analysis will use two approaches: thematic analysis for the incubator director's interview to identify key themes and strategic orientations, and descriptive statistical analysis for the student questionnaire to code, process, and quantify responses. A cross-sectional comparison will then highlight convergences and divergences between student perceptions and incubator management, providing a comprehensive view of the support mechanisms' effectiveness.

3.2.6 Ethical Considerations:

In accordance with ethical research principles, this study ensured the anonymity and confidentiality of all collected responses, whether from the student questionnaires or the statements obtained during the interview with the director. In addition, informed consent was systematically obtained from each participant prior to their involvement in the study, thereby ensuring their full awareness of the study's objectives and the use of their data.

3.2.7 Characteristics of the Study Sample:

To properly contextualize our investigation and allow for a meaningful interpretation of our results, it is essential to detail the demographic and academic characteristics of our sample.

Profile of Student Project Holders

The sample of 52 student project holders is distributed as follows:

Gender: The majority of the sample is male, with 62.5% men and 37.5% women.

Age Groups: Students are predominantly young, with 80% aged between 22 and 25 years. The remaining 20% fall within the 26–30 age range.

Level of Study: Master's level students (Master 2) represent the largest proportion of the sample (100%).

Field of Study: The sample shows notable diversity in academic specialties, with a predominance of technical and scientific fields: 37.5% in Agronomic and Biological Sciences, 31.3% in Electrical and Computer Engineering, followed by 25% in Construction Engineering, and 6.3% in Political Science and Law.

Project Activity Sector: The projects cover a wide range of sectors, including digital services and e-commerce (40%), agronomy (25%), environmental solutions (20%), and other areas (15%).

Duration of Incubator Support: The average duration of support within the incubator for the surveyed students is 6 months, with variations ranging from 3 to 10 months.

Taking these characteristics into account allows for a better understanding of the profile of key actors within the Tizi-Ouzou incubator and enriches the analysis of the observed entrepreneurial dynamics.

4. Presentation of Research Results:

This study draws on two data sources: an interview with the UMMTO incubator director, detailing its creation, missions, and achievements, and a student questionnaire assessing the skills developed through its training and support. Together, they provide both institutional and practical perspectives, highlighting the incubator's activities and the impact perceived by students on their entrepreneurial, managerial, and technical competencies.

4.1 Presentation of the UMMTO Incubator:

The UMMTO incubator, established in 2022, aims to promote innovative entrepreneurship within the university. It began by developing its infrastructure, team, and support mechanisms, and was officially accredited in January 2024, later receiving a certified incubator label in May 2024. Aligned with national strategies, it transforms ideas from students, faculty, and researchers into projects with socio-economic potential and strengthens university-industry links. By 2024/2025, it registered 104 projects, obtained 19 innovation labels, trained 384 students, and conducted over 75 workshops, building on previous achievements of project support, SME redirection, labeling, and patent applications.

4.2 Mission and Action Plan of the UMMTO Incubator:

The incubator serves as a space where students can access information, express themselves, and engage with their business ideas. Once interested in starting a business, students and graduates can benefit from the training sessions organized and led by the incubator's trainers, who teach them to think and act like entrepreneurs. Trainers and coaches support student project holders from the idea stage to the creation of their projects after graduation.

The incubator team designs a program aimed at developing the skills of these young student project holders in managerial, operational, and entrepreneurial domains. The training program covers entrepreneurship, leadership, coaching, Business Model Canvas (BMC), business planning, intellectual property, market research, design thinking, finance and accounting, and digital marketing.

In addition to this program, the UMMTO incubator organizes open days within the university, as well as awareness-raising events focused on startups and regulatory framework topics, including the provisions of Decree 1275.

4.3 Presentation of Results Related to the Training Provided by the UMMTO Incubator:

Following the survey conducted among students trained by the incubator of Mouloud Mammeri University of Tizi-Ouzou (UMMTO), the results collected through the questionnaire made it possible to assess the competencies perceived by the beneficiaries in three essential areas:

- **Entrepreneurial skills,**
- **Managerial skills,**
- **Technical and sector-specific management skills.**

This assessment is based on a self-evaluation approach carried out by the students using an aggregated rating scale ranging from 0 to 10, in which respondents were invited to estimate their level of mastery for each of the competencies considered.

The results are presented below in graphical form and are accompanied by an analysis aimed at highlighting the skills acquired through the support provided by the incubator, as well as

identifying the aspects that could be further strengthened within the training and entrepreneurial support mechanisms.

Before presenting and analyzing the empirical results, it is essential to clarify the theoretical framework employed to interpret the collected data. Indeed, the analysis of entrepreneurial support can be approached through several conceptual models developed in the literature, notably the 3P model (Project Owner – Project – Supporting Environment), the 3M model (Self – My Project – My Ecosystem), and the 3E model (Entrepreneur – Enterprise – Environment). All of these approaches highlight the systemic nature of the entrepreneurial process, which relies on the interaction between the entrepreneurial actor, the project developed, and the environment in which it evolves.

In this research, these three models constitute a conceptual foundation for understanding the different dimensions of university-based entrepreneurial support. However, to structure the analysis of the empirical results obtained from the survey conducted among incubated students, we have chosen to focus primarily on the 3P model proposed by Thierry Lévy-Tadjine and Robert Paturel.

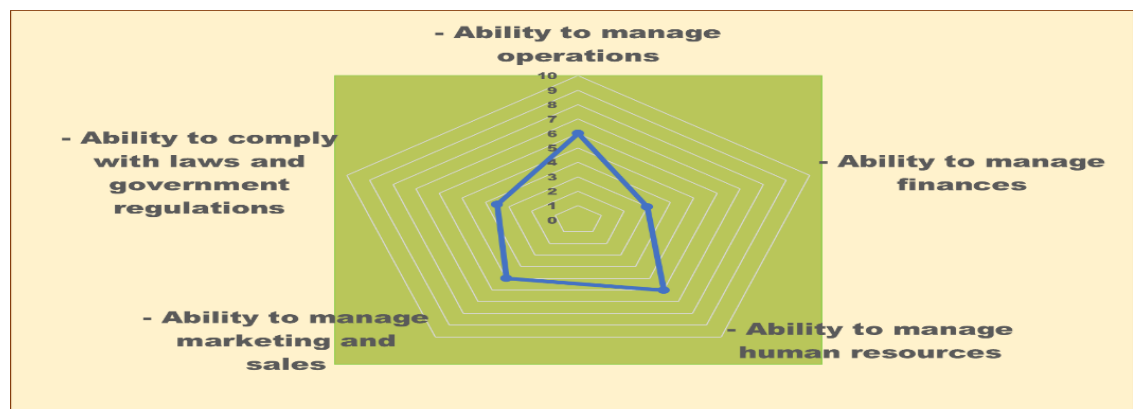
The choice of this model is justified by its particular relevance for analyzing entrepreneurial support mechanisms. Indeed, the 3P model explicitly highlights the interaction between the project owner (the entrepreneur), the project itself, and the supporting environment (the incubator or institutional framework). This approach allows for the simultaneous analysis of the development of the student entrepreneur's skills, the maturation of the entrepreneurial project, and the structuring role played by the university incubator as an institutional support framework.

Analysis of Entrepreneurial Skills through the 3P Model

Figure 01 : Entrepreneurial Skills.

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Source: Results of our survey.

The interpretation of results related to entrepreneurial skills can be deepened using the theoretical 3P model (Project Owner – Project – Supporting Environment) proposed by Lévy-Tadjine and Paturel. This model considers that entrepreneurial dynamics rely on the interaction among three interdependent dimensions: the entrepreneurial actor, the project undertaken, and the support environment. This systemic approach is widely used in contemporary research on entrepreneurial support, particularly to analyze the role of incubators in skill development.

In this perspective, the project owner (P2) corresponds to the incubated student entrepreneur. Survey results indicate that these students develop certain operational skills related to managing an entrepreneurial activity. The ability to manage operations receives a relatively satisfactory score of 6/10, suggesting a proper assimilation of basic principles associated with the organization and daily management of an entrepreneurial project. This outcome reflects the positive impact of the training offered by the incubator on the progressive construction of the students' entrepreneurial posture.

However, the analysis also reveals several deficiencies in areas crucial for the viability of entrepreneurial projects. Skills related to financial management, marketing and sales, human resources management, and regulatory compliance receive relatively low scores, ranging from 2 to 3 out of 10. These results indicate that some fundamental entrepreneurial knowledge remains insufficiently mastered by the project owners, potentially hindering the effective transformation of ideas into viable economic activities.

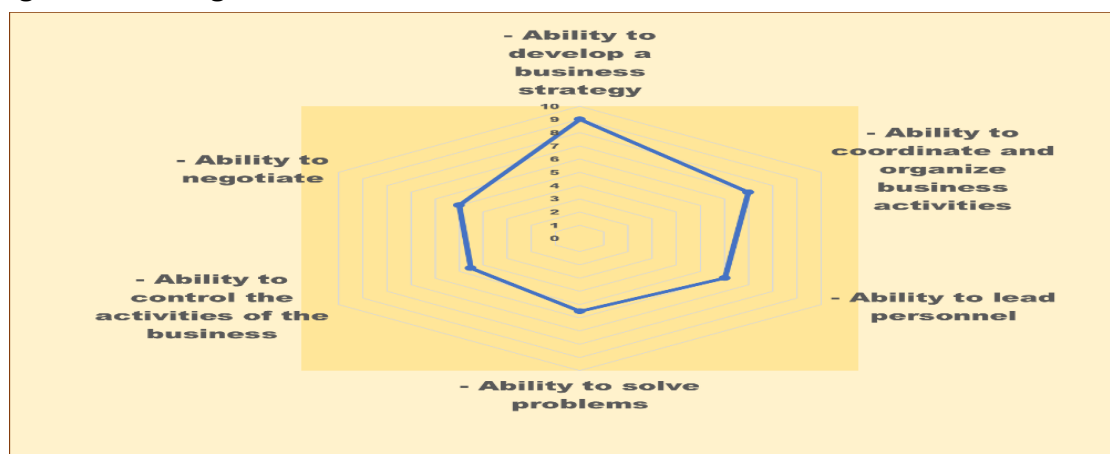
The second dimension of the model concerns the project itself (P1). The results show that project maturation remains heterogeneous among students. While some projects are beginning to be structured, their economic viability is often limited by gaps in market analysis skills or the structuring of the business model. Nevertheless, the study reveals that some students who benefited from more specialized academic supervision, particularly in technological and digital domains, present better-structured and more innovation-oriented projects. This suggests that the quality of academic guidance plays a determining role in the project maturation process.

Finally, the third dimension of the model refers to the supporting environment (P3), corresponding to the entrepreneurial support ecosystem in which project owners operate. In this study, the university incubator fulfills this supporting role. It provides students with a set of resources, including training, pedagogical guidance, and access to networks of actors. The incubator thus functions as an entrepreneurial learning environment fostering the progressive acquisition of entrepreneurial skills. However, the results suggest that the incubator could enhance certain aspects of its training offerings, particularly in financial management, entrepreneurial marketing, and legal frameworks, to more effectively support project maturation.

Thus, the analysis of entrepreneurial skills through the 3P model highlights that the entrepreneurial development of students relies on the articulation between the project owner's progression, the structuring of the project, and the quality of the support environment provided by the university incubator.

Analysis of Managerial Skills through the 3P Model

Figure 02 : Managerial skills.



Source: Results of our survey.

Results regarding managerial skills can also be interpreted through the 3P model, which highlights the interactions among the entrepreneur, their project, and the supporting environment. This approach allows a better understanding of how incubation programs

contribute to the development of management capabilities necessary for the creation and operation of an enterprise.

Here, the project owner (P2) corresponds to the student entrepreneur gradually developing managerial and organizational capacities. Results show that students demonstrate particularly high ability in strategic business planning, scoring 9/10. This indicates that the incubator's training promotes the development of analytical and strategic skills, enabling project owners to formulate an entrepreneurial vision and guide the future development of their initiatives.

However, the results also reveal limitations in operational managerial skills. Negotiation and problem-solving abilities score 4.5/10 each, while the ability to monitor business activities reaches only 4/10. Leadership capacity is evaluated at 5/10. These results suggest that while project owners have a relatively clear strategic vision, they still face difficulties in managing organizational interactions and implementing managerial decisions.

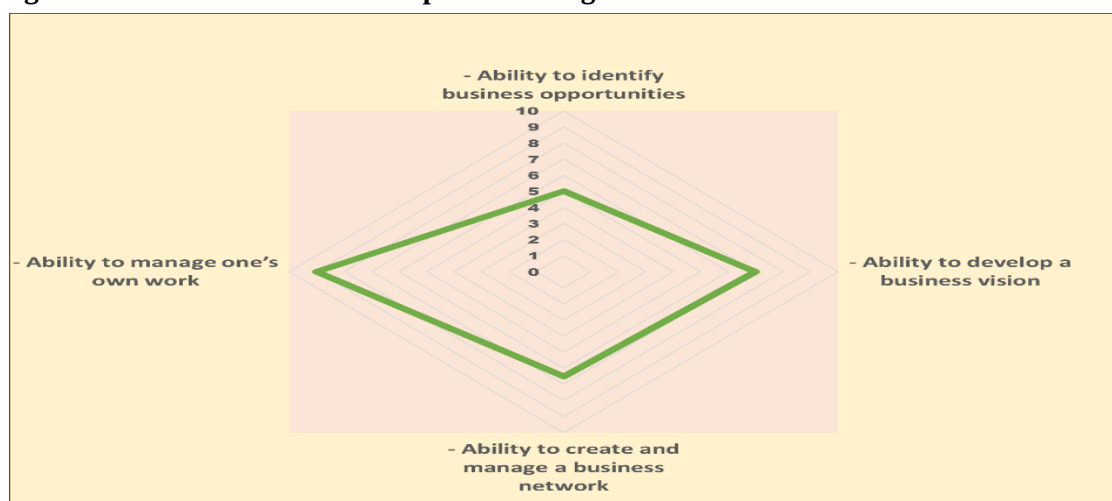
From the project perspective (P1), these outcomes reflect the partial structuring of entrepreneurial projects. Transforming an entrepreneurial idea into a functional organization requires managerial skills to coordinate activities, manage teams, and monitor performance. The observed scores indicate that these dimensions are still in a consolidation phase.

The supporting environment (P3) corresponds to the institutional support provided by the university incubator. Through its training and pedagogical activities, the incubator plays a central role in transmitting managerial knowledge and structuring entrepreneurial projects. However, the results suggest that this environment could be strengthened by integrating more experiential learning approaches, such as entrepreneurial simulations, real-case studies, or negotiation and leadership workshops.

Thus, the analysis of managerial skills through the 3P model demonstrates that the development of the project owner and the maturation of the project heavily depend on the capacity of the support environment to offer pedagogical devices adapted to the realities of entrepreneurial action.

Analysis of Technical and Sectoral Skills through the 3P Model

Figure 03 : Technical and sector-specific management skills.



Source: Results of our survey.

Technical and sectoral skills can also be analyzed using the 3P model, highlighting the dynamic relationship between the entrepreneurial actor, the project, and the support ecosystem.

Here, the project owner (P2) corresponds to incubated students who gradually develop technical competencies and autonomy in managing their entrepreneurial activities. The

relatively high score for work management (7/10) reflects satisfactory organizational autonomy, a crucial element for structuring activities and ensuring the continuity of entrepreneurial initiatives.

However, intermediate scores for business vision development and opportunity identification (5/10) indicate that some strategic dimensions of the entrepreneurial process remain to be consolidated. While students possess a solid conceptual foundation, their ability to convert ideas into concrete economic opportunities still requires deeper support.

From the project perspective (P1), results indicate partial maturation of entrepreneurial projects. Projects guided by specialized academic supervision—particularly in technological and digital domains—show higher structuring and stronger innovation orientation. Conversely, projects following only general incubator training often remain exploratory.

The supporting environment (P3), represented by the university incubator, provides a structured institutional framework supporting skill development and project maturation. However, the relatively low score in networking capacity (4/10) highlights limitations in integrating students within the entrepreneurial ecosystem. Developing professional networks is essential for access to resources, partners, and market opportunities. The incubator could thus strengthen mechanisms for integrating students into the ecosystem through networking events, mentoring with experienced entrepreneurs, and partnerships with local economic actors.

Hence, the analysis of technical and sectoral skills through the 3P model shows that entrepreneurial development depends on the interaction between the project owner's capacities, project maturation, and the quality of the support environment provided by the university incubator.

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➤ In summary, the analysis of the results through the lens of the 3P model highlights the interaction between the project owner, the project itself, and the supporting environment:

-Firstly, the Project (P1) namely the entrepreneurial initiative itself—constitutes the starting point of the observed entrepreneurial dynamics. Students show relatively high capacity to generate innovative ideas and identify value creation opportunities. However, the economic and organizational maturity of the projects remains limited. Low scores in essential managerial skills, notably financial management, marketing, and negotiation (2–4.5/10), indicate the need for more in-depth operational and strategic support. Projects guided by specialized faculty supervision, particularly in technological and digital domains, are generally better structured and more innovation-oriented.

-Secondly, the Project Owner (P2) corresponds to the student entrepreneur. Results reveal a high level of motivation and entrepreneurial engagement among incubated students, mostly aged 22–25. Strategic capacity scores reach 9/10, reflecting significant development of entrepreneurial skills related to vision, creativity, and strategic planning. The incubator plays a key role in constructing students' entrepreneurial identity, fostering transversal skills such as leadership, initiative, and self-confidence.

-Thirdly, the Supporting Environment (P3) refers to the university incubator. It constitutes a structuring framework supporting project owner training, project maturation, and gradual integration into the entrepreneurial ecosystem. Qualitative responses, however, reveal limitations due to weak interactions with local economic actors and difficulties accessing funding. These constraints partially reduce the effectiveness of the support system and limit the conversion of incubated projects into fully operational entrepreneurial initiatives.

Thus, the 3P-based analysis demonstrates that the effectiveness of university entrepreneurial support relies on the dynamic interplay between project maturation (P1), the development of the project owner's skills and entrepreneurial posture (P2), and the capacity of the supporting

environment to mobilize the necessary resources (P3). Balancing these three dimensions appears crucial to ensure the viability and sustainability of entrepreneurial projects emerging from the university

General Conclusion:

This research, focused on the role of university incubators in Algeria and illustrated through the in-depth case study of the incubator at Mouloud Mammeri University of Tizi-Ouzou (UMMTO), has highlighted the growing importance of integrating entrepreneurship within the university environment. The field analysis, combined with a qualitative methodological approach, revealed that universities—now supported by an ambitious regulatory framework, particularly Decrees 1275 and 008—are expected to play a strategic role in fostering innovation, developing entrepreneurial competences, and promoting the emergence of student startups.

The case study of the UMMTO incubator clearly shows that such structures serve as essential levers for supporting project holders by providing targeted training, personalized guidance, and an environment conducive to the maturation of their ideas. The survey results collected from student beneficiaries confirm that this support significantly contributes to the development of entrepreneurial, managerial, and technical skills, although certain dimensions—such as financial management, marketing, and understanding of the legal framework—still require further strengthening.

The analysis of the national context also revealed several structural challenges that hinder the full development of university-based entrepreneurship in Algeria: a limited entrepreneurial culture, restricted access to funding, administrative burdens, lack of infrastructure, and insufficient post-creation support. These obstacles underscore that, despite the progress made, the transition toward a genuine knowledge-based economy remains gradual and depends both on institutional commitment, the evolution of pedagogical practices, and the reinforcement of partnerships between universities, enterprises, and public institutions.

From a methodological perspective, the qualitative approach adopted—combining a semi-structured questionnaire administered to students with an open interview conducted with the director of the incubator—made it possible to cross-reference beneficiary perceptions with the institutional viewpoint. This complementarity enriched the interpretation of the results and provided a deeper understanding of the internal dynamics of the incubator, including its achievements and its limitations.

Ultimately, this study shows that the UMMTO incubator represents a concrete example of the evolving role of Algerian universities, which are now called upon to move beyond their traditional mission of knowledge transmission to become key actors in innovation, value creation, and the training of future entrepreneurs. However, to enhance the effectiveness of these mechanisms, several improvement pathways can be considered: strengthening practical training in management and marketing, developing strong economic partnerships, improving post-creation follow-up, and promoting a broader diffusion of entrepreneurial culture across all scientific and academic disciplines.

Thus, the Algerian university, through its incubators, is gradually positioning itself as a driver of socio-economic transformation. Yet, the long-term success of this dynamic will depend on the ability to overcome structural challenges and consolidate support mechanisms—an essential condition for preparing students to meet the demands of an evolving labor market and for stimulating national innovation.

Finally, it is important to highlight several methodological limitations that should be taken into account when interpreting the results. The relatively small sample size—52 respondents out of the 128 students who were invited to participate—reduces the statistical power of the analysis

and may introduce a selection bias. Furthermore, the reliance on a single case study, namely the incubator of UMMTO, provides an in-depth understanding of a specific context but limits the generalizability of the findings to the broader population of university incubators. Future research would therefore benefit from adopting a comparative approach involving multiple structures and larger samples in order to enhance the external validity and the robustness of the results.

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