MEST Journal

THE INNOVATIVE ALGERIAN UNIVERSITY AS A WEALTH CREATOR

RETHINKING THE ROLE OF HIGHER EDUCATION IN ALGERIA'S KNOWLEDGE ECONOMY

Karim Amamra
Mohamed Cherif Messaadia University, Economic Research and Studies Laboratory, Faculty of Economic, Commercial and Management Sciences, Souk Ahras, Algeria

ARTICLE INFO

Open access

JEL Category:
I23, L26, O31, O38

Keywords:

entrepreneurial university
academic entrepreneurship
business incubators
knowledge economy
Algeria
Triple Helix
startup ecosystem
innovation policy

ABSTRACT

Universities across the developing world are under mounting pressure to move beyond their traditional roles as educators and researchers and to become active drivers of economic transformation. This paper examines Algeria's accelerating strategy to build an innovation-driven, wealth-creating university system. Drawing on entrepreneurial university models and the Triple Helix and Quadruple Helix frameworks, the study maps Algeria's evolving legislative architecture — from Executive Decree 20-254 (2020) to Decision 008 (2025) — and analyses the five institutional interfaces underpinning its national startup ecosystem. By mid-2025, the architecture encompassed 124 university business incubators, 91 Technology and Innovation Support Centres (CATI), 51 Artificial Intelligence Houses, over 11,800 registered innovative projects, approximately 7,800 startups on the Startup.dz platform, and 1,700 patent applications. Drawing on the AUNEI university network and the national subsidiary enterprise platform (RNF), the paper provides an empirically grounded assessment of the ecosystem's strengths and structural gaps. Seven evidence-based reforms are proposed and benchmarked against international models from Finland, South Korea, and the United States.

1 INTRODUCTION

This study employs a qualitative policy analysis based on documentary analysis of Algerian legislation, official institutional reports, and relevant international literature on entrepreneurial universities and innovation ecosystems. Rather than testing hypotheses empirically, the paper synthesizes policy developments, institutional evidence, and comparative international practices to assess the current state of Algeria's entrepreneurial university ecosystem and to propose evidence-informed policy recommendations. This methodological approach

Address of the author:
Karim Amamra
karim.amamra@univ-soukahras.dz

Received: 16.06.2026
Revised: 30.06.2026
Accepted: 03.07.2026
Available online: 03.07.2026

is particularly appropriate for examining an evolving institutional framework in which legislative reforms, organisational structures, and policy implementation are closely interconnected. By integrating national evidence with established international models, the study seeks to provide both an analytical assessment of the current system and practical insights that may inform future policy development.

1.1 A Third Mission Emerges

For most of its history, the modern university operated on a relatively simple contract with society: train the next generation of professionals and push the boundaries of human knowledge. These two obligations — teaching and research — defined the institution's identity for centuries. Yet by the close of the twentieth century, something was quietly shifting. Governments, businesses, and development agencies began asking an uncomfortable question: if universities are such powerful engines of knowledge, why do so many economies struggle to convert that knowledge into prosperity?

The answer, many scholars concluded, lay not in the quality of the research being produced, but in the absence of any systematic mechanism to translate it into commercial and social value. Out of that diagnosis grew what Burton Clark (1998) called the 'entrepreneurial university' — an institution that consciously adds a third mission to its portfolio: the creation of economic wealth through the active transfer of knowledge into the marketplace.

1.2 The Triple Helix: Three Actors, One Ecosystem

The most influential theoretical lens for understanding this transformation was introduced by Etzkowitz and Leydesdorff (1995). Their Triple Helix model describes the innovation ecosystem as a dynamic interplay among three institutional spheres: the university, industry, and government. What makes the model genuinely useful is its insistence that none of these spheres can function optimally in isolation. Sustainable innovation requires its boundaries to become permeable — universities must think commercially, firms must think scientifically, and governments must think systemically.

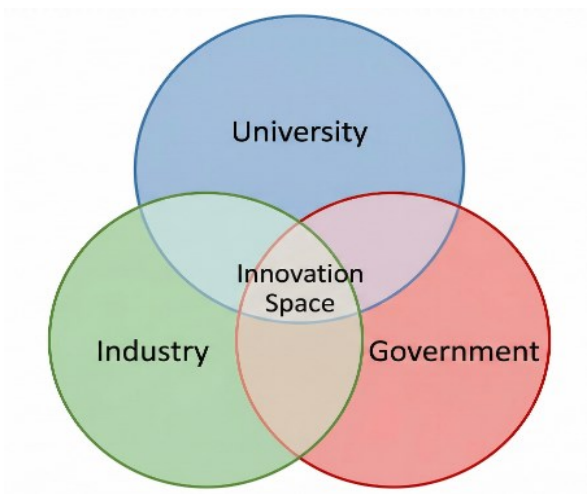

Figure 1. *The Triple Helix Model of University–Industry–Government Relations*
Source: Adapted from Etzkowitz and Leydesdorff (1995)

Subsequent scholarship has extended the model considerably: Ranga and Etzkowitz (2013) formalised the concept of 'innovation spaces' generated at the intersections of the three spheres, while Leydesdorff and Ivanova (2016) introduced entropy-based measures to quantify the synergy generated within national innovation systems. Algeria's recent higher education reforms explicitly embrace this logic, institutionalised through two dedicated digital platforms: AUNEI (aunei.mesrs.dz) and the National Subsidiary Enterprise Platform (rnf.mesrs.dz).

1.3 Beyond the Triangle: The Quadruple Helix

Carayannis and Campbell (2009) argue convincingly that a fourth actor — civil society and the end user — must be incorporated if innovation is to be socially meaningful rather than merely technically impressive. This Quadruple Helix perspective offers an important corrective to top-down approaches that produce innovations nobody actually needs. Afonso et al. (2012) further demonstrated that national innovation performance correlates strongly with the degree to which civil society is institutionally embedded in the innovation governance structure — a finding with direct relevance to Algeria.

2 BUILDING THE SYSTEM: ALGERIA'S INSTITUTIONAL ARCHITECTURE

2.1 A Legislative Journey in Four Steps

Algeria has built its innovation architecture incrementally, each legislative act responding to gaps identified in the one before it. By March 2025, this pathway had produced a network of 124 university business incubators, 91 Technology and Innovation Support Centres (CATI), and 51 Artificial Intelligence Houses, coordinated at the national level through the AUNEI network and governed by MESRS digital platforms:

- Executive Decree No. 20-254 (September 2020) established the National Commission responsible for awarding the 'Startup' and 'Business Incubator' labels — a certification mechanism that unlocks fiscal incentives, reduces administrative burdens, and provides access to public financing.
- Decision No. 1244 (September 2022) created a National Coordination Committee, reporting directly to the Minister of Higher Education, to oversee the entire innovation and incubation ecosystem.
- Decision No. 1275 (September 2022) formalised the mechanisms through which graduation projects — at Bachelor's, Master's, and Doctoral levels — could be transformed into registered economic enterprises.
- Decision No. 008 (February 2025) tightened the relationship between a student's dissertation and their enterprise project, requiring that both be developed simultaneously under a unified ministerial template.

2.2 Five Interfaces, One Ecosystem

The legislative framework is given operational substance through five distinct institutional interfaces, each serving a different function within the broader ecosystem. By early 2025, the AUNEI network encompassed institutions across 58 wilayas, making it one of the most geographically comprehensive university innovation networks in Africa.

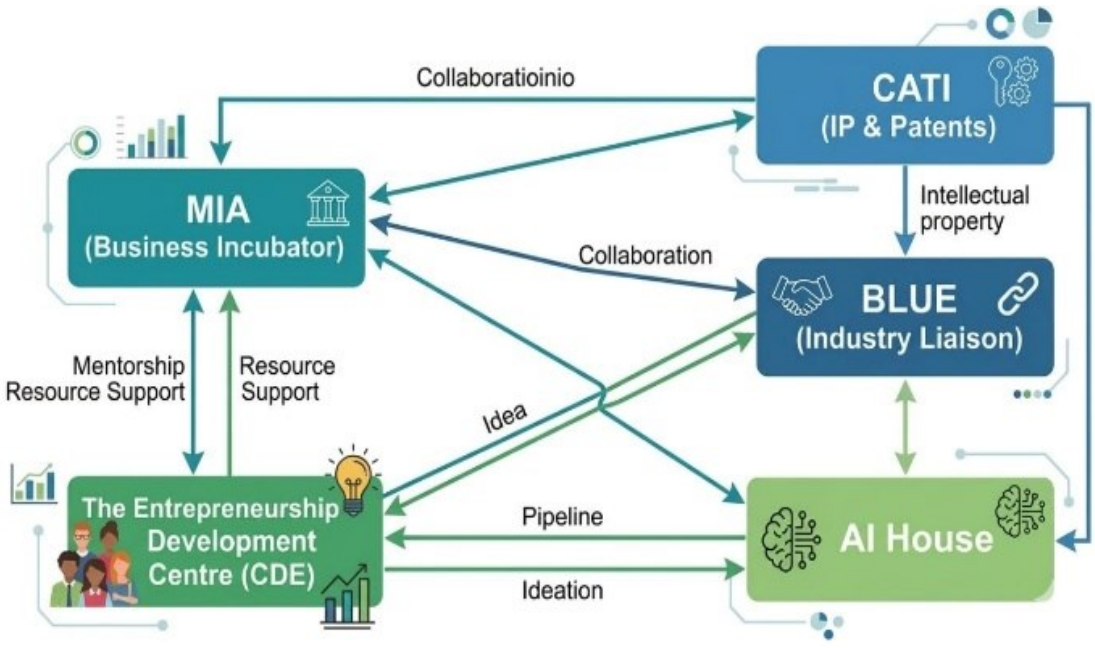

Figure 2. *Algeria's Five University Institutional Interfaces*
Source: MESRS (2022–2025)

The University Business Incubator (MIA) receives the most promising projects and accompanies their founders through the legal and administrative process of formal enterprise registration, including the application for the national startup label.

The Entrepreneurship Development Centre (CDE) works in partnership with the NESSDA national agency to run awareness campaigns and provide practical training for students aiming at conventional business creation.

The Technology and Innovation Support Centre (CATI) specialises in intellectual property, managing the local registration of patents generated within the university environment.

The Artificial Intelligence House embeds AI literacy and AI-driven research directly into the academic mainstream, positioning Algerian universities to participate in one of the defining technological revolutions of the century.

The University–Enterprise Liaison Office (BLUE) manages joint training agreements, collaborative research contracts, and technology transfer arrangements. BLUE offices are directly linked to the national RNF platform (rnf.mesrs.dz), which tracks the creation and operational performance of university subsidiary enterprises (filiales).

2.3 Student Entrepreneur: A Step-by-Step Journey

The pathway from idea to enterprise unfolds across six relatively clear stages. The journey begins with structured entrepreneurship training — courses designed to give students a practical vocabulary for business creation. Students then assemble a mixed team: peers and faculty supervisors. The team presents its concept to an evaluation committee, which classifies the project as a startup, a micro-enterprise, or a patent application. The project is registered on the national Startup.dz platform, and — in the most distinctive element of the Algerian approach — the student's graduation dissertation must be developed in direct alignment with their enterprise project, making entrepreneurship an assessed academic requirement.

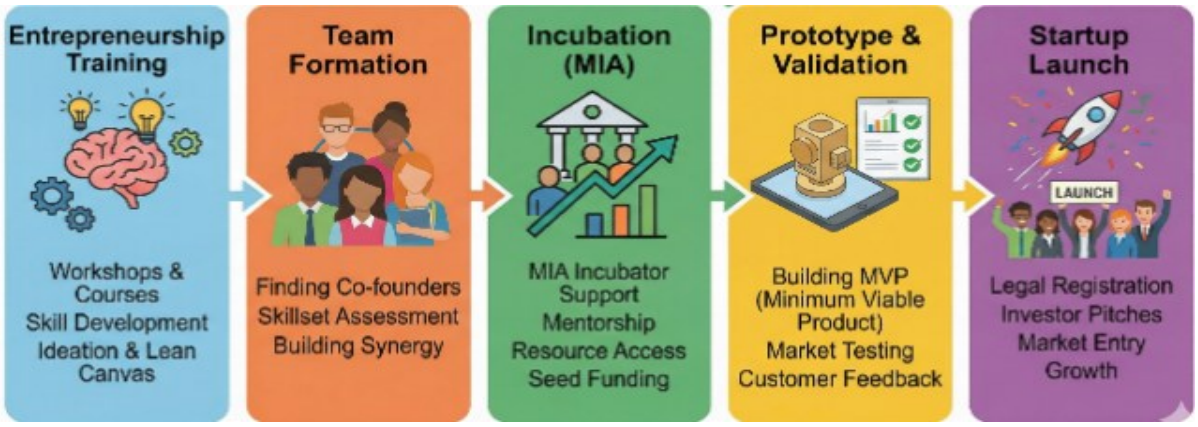

Figure 3. *Student Entrepreneur Pathway: From Classroom to Startup*
Source: Author based on Decisions 1275/2022 and 008/2025

2.4 The Algerian Startup Fund (ASF)

Born from a presidential vision, the Algerian Startup Fund (ASF) was initiated by President Abdelmadjid Tebboune and publicly announced at the first Algeria Disrupt in 2020. Established in partnership with six public banks, the fund acts as a catalyst: it professionalises assessment across product, market, business model, and governance dimensions, speeds up investment decisions, and delivers measurable post-investment support. To bring capital closer to founders across all 58 wilayas, ASF has rolled out regional mechanisms with tickets up to DZD 150 million per project. This territorial architecture increases investment reach, fosters skilled job creation, and helps cultivate national champions in strategic sectors — including Industry 4.0, health, agri-tech, fintech, education, and green-tech.

3 WHERE THE SYSTEM FALLS SHORT

3.1 The Cultural Problem

Policies can mandate structures. They cannot mandate mindsets. In Algeria, as in many countries with a strong tradition of public employment, the deepest obstacle facing the entrepreneurial university agenda is not regulatory but cultural. For generations of graduates, a stable government job has represented not merely an employment option but a social aspiration — a mark of success and a source of family pride. Entrepreneurship, by contrast, is culturally

associated with risk, uncertainty, and the possibility of failure.

A student who participates in incubation activities because it is required to graduate, but who intends from the outset to pursue a civil service position, will produce a paper enterprise, not a real one. Similarly, a professor asked to supervise entrepreneurial projects without ever having run a business themselves will inevitably teach theory rather than wisdom. Until the culture changes — and cultural change takes a generation, not a ministerial decision — the system will operate well below its potential.

3.2 The Financing Gap

The ecosystem relies almost entirely on public instruments, primarily the NESSDA national agency. This creates a critical vulnerability: public funding is typically risk-averse, limited in scale, and sensitive to political cycles. The projects most likely to generate breakthrough innovations are precisely those that require patient, high-risk capital of the kind that private venture funds are uniquely positioned to provide.

The contrast with leading innovation economies is stark. Finland invests approximately 0.15% of GDP in venture capital; the United States, 0.77%; the United Kingdom, 0.44%; and Singapore, 0.61%. Venture capital in Algeria remains under 0.05% of GDP, lagging by a factor of 50–80 compared to leading innovation economies. That gap reflects not a difference in raw talent or ideas, but a difference in the institutional plumbing through which good ideas get funded.

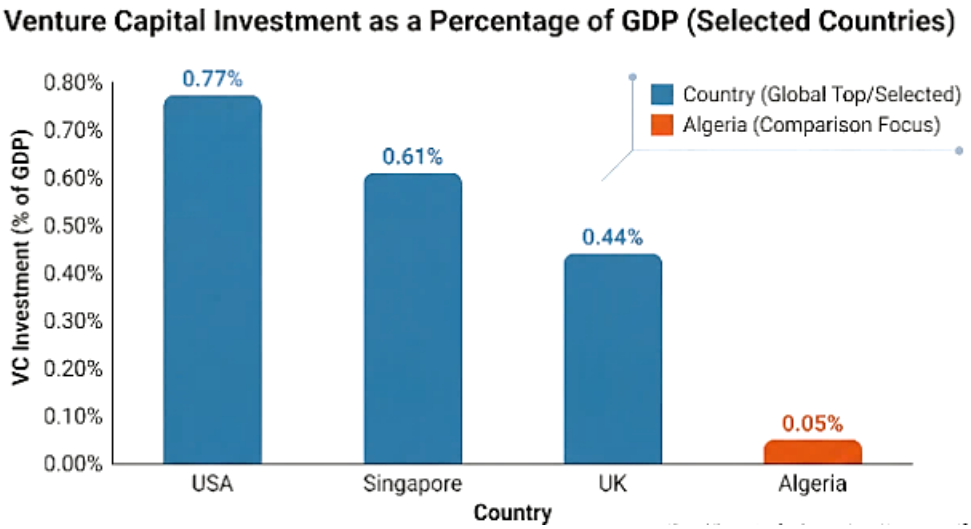

Figure 4. *Venture Capital Investment as a Share of GDP: Algeria vs. Leading Innovation Economies*
Sources: GEM (2025) and OECD Venture Capital Statistics (2025)

3.3 International Isolation

In a globalised innovation economy, a patent that is only registered domestically offers very limited protection. Algeria's 91 CATI centres currently handle over 1,700 annual patent applications — yet the overwhelming majority remain domestically registered only. Algeria ranks 118th in the WIPO Global Innovation Index 2024, with PCT international applications among its weakest sub-indicators. Algeria's CATI centres are not yet formally connected to WIPO's Technology and Innovation Support Centre (TISC) programme — a free resource that provides developing-country institutions with guidance on international patent searches and PCT filings.

3.4 Scope Too Narrow: Why Wait Until Graduation?

By targeting primarily final-year students, the system misses the most fertile period of entrepreneurial imagination. The history of transformative technology companies is littered with ventures that began not in formal graduation projects but in informal dormitory conversations, early-course hackathons, and first-year curiosity. Restricting the system's entry point to the final year is a self-imposed limitation that the evidence of international experience does not support.

4 A REFORM AGENDA: SEVEN PROPOSALS

4.1 Embed Entrepreneurship from Day One

Introduce a compulsory Entrepreneurship Unit across all disciplines from the first year of study. In Year 1, it introduces students to the basic vocabulary of innovation and business creation. In Year 2, the Business Model Canvas applies to real local challenges. By Year 3, students are expected to have developed and tested a prototype venture concept. Decision 008/2025 already mandates simultaneous dissertation and enterprise project development in the final year; extending this entrepreneurial logic to earlier years would create the pipeline of prepared students that the system's incubators currently lack. Nabi et al. (2017), in a meta-analysis of 73 entrepreneurship education studies, confirmed that intention-based entrepreneurship education delivered early on the academic journey produces significantly stronger venture creation outcomes than end-of-programme interventions alone.

4.2 Create University Venture Funds

Each major Algerian university should establish a joint venture fund in partnership with domestic commercial banks, public development institutions, and a network of certified Angel Investors. The fund would be capitalised partly by government seed money but sustained over time through a share of revenues generated by successful spinouts and licensed patents — creating the self-reinforcing financial cycle that has made Oxford University Innovation and Stanford's StartX Fund economically sustainable. Algeria's 2023 Finance Act introduced provisions for Fonds Communs de Placement en Capital-Risque (FCPR) — a venture capital collective investment vehicle — which remains underutilised in the university context but represents a ready-made legal structure for precisely this purpose (Mason & Brown, 2014).

4.3 Entrepreneurs in Residence

Universities should establish formal Entrepreneurs in Residence (EiR) programmes — multi-semester engagements with successful business founders who agree to teach courses, mentor student teams, and evaluate incubated projects. This practice, now standard at UC Berkeley's Haas School of Business and ETH Zürich, systematically transfers tacit knowledge directly into the academic environment. Argote and Fahrenkopf (2016) demonstrated that tacit knowledge transfer is most effective when practitioners are embedded in teams rather than invited as occasional lecturers — an important design principle for the EiR engagement model within Algerian incubators.

4.4 Connect to WIPO: Internationalise the Patent System

WIPO's TISC programme is free, well-established, and specifically designed for institutions in developing countries. Signing a formal agreement to connect Algeria's 91 CATI centres to the TISC network would give university inventors access to comprehensive international patent databases, guidance on prior-art searches, and support for international filing under the PCT system. Morocco, Tunisia, and Egypt have each formalised TISC partnerships with WIPO; Algeria's absence from the network is a correctable anomaly. The AUNEI network could manage the TISC partnership centrally, achieving network-level scale rather than institution-by-institution implementation.

4.5 Transform Startup.dz into an Intelligent Platform

The national Startup.dz platform currently functions primarily as a registration portal. By early 2025, it had processed approximately 7,800 startup registrations — a significant volume that nevertheless represents only a fraction of the 11,800+ innovative projects tracked across the university system. An AI-driven preliminary screening tool could provide applicants with instant, personalised feedback on their business model before they face a formal committee. A searchable investor directory could help student teams make direct connections with Angel Investors and institutional funds. Platforms such as AngelList (USA) and F6S (Europe) demonstrate what is achievable when these functions are integrated into a coherent digital environment.

4.6 Build University Innovation Districts

Some of the world's most productive innovation clusters — Silicon Valley (USA), Sophia Antipolis (France), and Finland's Otaniemi campus — share a common architectural principle: physical proximity between researchers, entrepreneurs, investors, and industrial partners. Audretsch and Feldman (1996) established that knowledge spillovers are strongly localised — geographically concentrated innovation districts generate disproportionately more commercialisable outputs than equivalent resources dispersed across a national system. Algeria should develop integrated University Innovation Districts around its largest and most research-intensive universities — Batna, Oran, Constantine, and Tizi Ouzou — deliberately co-locating incubators, CATI patent offices, AI Houses, BLUE liaison offices, and private sector tenants within walking distance of each other.

4.7 Measure What Matters

The current Algerian system lacks a systematic, publicly reported framework for evaluating outcomes. The AUNEI platform and the RNF subsidiary enterprise tracker together contain the raw data needed to construct the required indicators; what is currently missing is the analytical layer that converts raw counts into meaningful performance metrics and publishes them transparently. The following five indicators, drawn from the Global Entrepreneurship Monitor, the WIPO Global Innovation Index 2024, and Algeria's own platform data, would provide a credible basis for annual impact assessment (Figure 5):

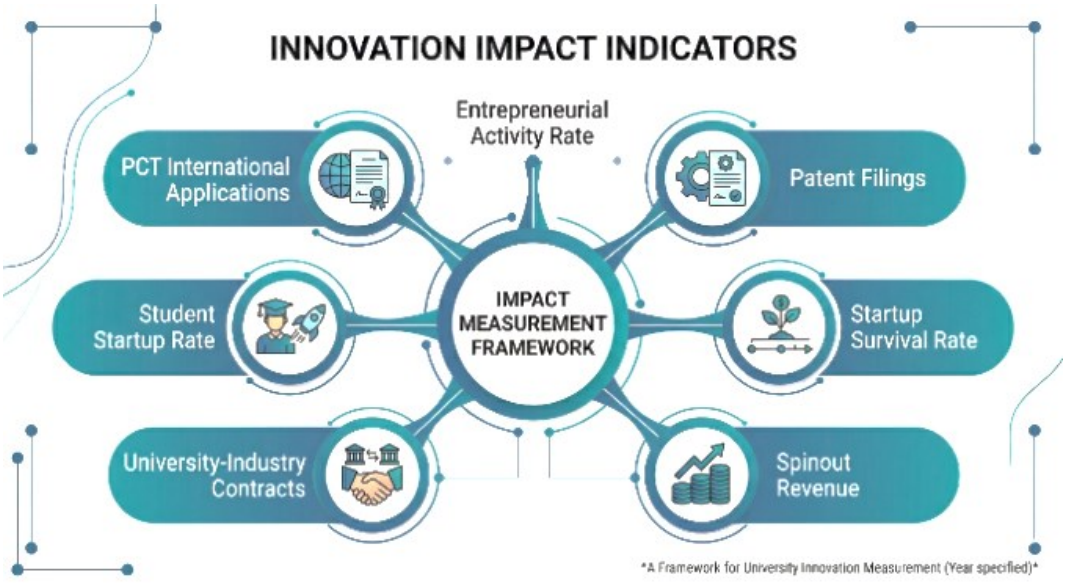

Figure 5. *Proposed Multi-Dimensional Impact Measurement Framework*
Sources: Adapted from GEM (2023) and WIPO Global Innovation Index (2023)

- Entrepreneurial Activity Rate (GEM) — the proportion of the adult population actively involved in early-stage business creation, disaggregated by opportunity-driven versus necessity-driven motivation.
- Global Innovation Index ranking — an external, internationally benchmarked assessment of Algeria's overall innovation system performance.
- Number of internationally registered patents per year — the most direct indicator of the CATI system's effectiveness.
- Startup survival rate at three and five years — the acid test of whether the ecosystem is producing real businesses or merely diploma projects.
- Revenue generated by enterprises that have exited the incubator programme — the ultimate measure of the system's contribution to economic value creation.

5 LEARNING FROM OTHERS: INTERNATIONAL COMPARISONS

Table 1 maps the Algerian system's current state against the practice of four leading innovation

economies across five critical dimensions. The purpose is not to suggest that Algeria should copy any of these wholesale models, but to identify specific design features that are transferable and have demonstrated results.

Table 1. *Comparative Analysis: Algeria vs. Leading International Innovation Economies*

Dimension	Algeria (2025)	Leading Example	Key Transferable Lesson
Legal Framework	Decree 20-254 + Decisions 1244 & 008 (2020–2025)	USA: Bayh-Dole Act (1980) — universities own patents from federally funded research	Allow universities to own and commercialise patents independently
Financing	NESSDA (public agency) + ASF	Finland & South Korea: hybrid public–private university venture funds	Co-fund with commercial banks and certified Angel Investors
Evaluation	Multi-ministry government committee	USA/Germany: mixed panels of investors, academics, and independent peers	Add investor and alumni judges to reduce bureaucratic bias
Impact Measurement	No standardised system yet	Finland: annual GEM + GII reporting tied to policy revision	Publish an annual national startup ecosystem scorecard
Incubation Environment	Emerging incubators on individual campuses	Sophia Antipolis (France)	Develop integrated Innovation Districts around major universities

Sources: GEM Global Report (2024), WIPO Global Innovation Index (2024), and MESRS Algeria (2025)

Finland and South Korea each invested more than a decade in simultaneous cultural reform, hybrid financing, and rigorous impact evaluation before their innovation ecosystems reached critical mass. Algeria's legislative foundations — reinforced by the AUNEI and RNF digital platforms and by the comprehensive institutional network established between 2020 and 2025 — are among the most structurally ambitious in the MENA region. The WIPO Global Innovation Index 2024 ranks Algeria 118th globally but notes significant improvement in institutional inputs over the previous three years.

6 CONCLUSIONS

There is a great deal to admire in what Algeria has built over the past five years. The legislative architecture is coherent, progressively refined, and grounded in an internationally recognised theoretical model. The five institutional interfaces — 124 business incubators, 91 CATI patent centres, and 51 AI Houses, federated through the AUNEI network — address distinct and real functions within the innovation pipeline. The integration of entrepreneurship into the graduation process through Decision 008/2025 is, in its ambition, more structurally bold than what many wealthier countries have managed.

And yet structures, however well designed, do not automatically produce outcomes. The Algerian system faces three intertwined challenges that no further legislative decree can resolve on its own. The cultural challenge requires a generational shift in how students, families, and professors think about risk, failure, and the meaning of professional success. The financing challenge requires the patient construction of a hybrid investment ecosystem in which public instruments crowd in private capital rather than crowding it out. The internationalisation challenge requires embedding the system in global networks — of investors, patent offices, innovation platforms, and peer universities.

Three of the seven proposals set out in this paper — connecting CATI centres to WIPO-TISC, integrating Startup.dz with the AUNEI and RNF platforms, and publishing an annual national innovation scorecard — are actionable within a

single budgetary cycle and require no new legislation. Taken together, all seven would move Algeria from a country with a well-intentioned innovation architecture to one with a genuinely functioning entrepreneurial ecosystem — an ecosystem capable of generating the knowledge-intensive enterprises and employment opportunities that the country's young population so urgently needs.

REFERENCES

Afonso, O., Monteiro, S., & Thompson, M. (2012). A growth model for the quadruple helix. *Journal of Business Economics and Management, 13*(5), 849–865. https://doi.org/10.3846/16111699.2011.626438

Argote, L., & Fahrenkopf, E. (2016). Knowledge transfer in organizations: The roles of members, tasks, tools, and networks. *Organizational Behavior and Human Decision Processes*, 136, 146–159. https://doi.org/10.1016/j.obhdp.2016.08.003

Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *Journal of Technology Transfer, 39*(3), 313–321. https://doi.org/10.1007/s10961-012-9288-1

Audretsch, D. B., & Feldman, M. P. (1996). R&D spillovers and the geography of innovation and production. *American Economic Review, 86*(3), 630–640. https://www.jstor.org/stable/2118216

Carayannis, E. G., & Campbell, D. F. J. (2009). Mode 3 and Quadruple Helix: Toward a 21st Century Fractal Innovation Ecosystem. *International Journal of Technology Management*, 46(3-4), 201–234. https://doi.org/10.1504/IJTM.2009.023374

Clark, B. R. (1998). *Creating Entrepreneurial Universities: Organizational Pathways of Transformation*. Pergamon Press.

Democratic and Popular Republic of Algeria. (2020). Executive Decree No. 20-254 of 15 September 2020. *Official Gazette*, (55).

Etzkowitz, H., & Leydesdorff, L. (1995). The Triple Helix: University–industry–government relations. *EASST Review, 14*(1), 14–19. https://ssrn.com/abstract=2480085

GEM Consortium. (2024). Global Entrepreneurship Monitor: Global Report 2023/24. GEM. https://www.gemconsortium.org/report/global-entrepreneurship-monitor-gem-20232024-global-report-25-years-and-growing

Guerrero, M., Cunningham, J. A., & Urbano, D. (2015). Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. *Research Policy, 44*(3), 748–764. https://doi.org/10.1016/j.respol.2014.10.008

Guerrero, M., & Urbano, D. (2012). The development of an entrepreneurial university. *Journal of Technology Transfer, 37*(1), 43–74. https://doi.org/10.1007/s10961-010-9171-x

Leydesdorff, L., & Ivanova, I. (2016). “Open innovation” and “triple helix” models of innovation: Can synergy in innovation systems be measured? *Journal of Open Innovation: Technology, Market, and Complexity, 2*(1), 11. https://doi.org/10.1186/s40852-016-0039-7

Mason, C., & Brown, R. (2014). Entrepreneurial ecosystems and growth-oriented entrepreneurship: Background paper prepared for the workshop organised by the OECD LEED Programme and the Dutch Ministry of Economic Affairs. Discussion Paper. OECD. https://www.oecd.org/cfe/leed/entrepreneurial-ecosystems.pdf

Ministry of Higher Education and Scientific Research, Algeria. (2022a). Decision No. 1244 establishing the National Coordination Committee for Monitoring Innovation and University Business Incubators, 25 September 2022.

Ministry of Higher Education and Scientific Research, Algeria. (2022b). Decision No. 1275 on the Transformation of Student Projects into Economic Enterprises, 27 September 2022.

Ministry of Higher Education and Scientific Research, Algeria. (2025a). Decision No. 008 of 23 February 2025 (amending Decision 1275).

Ministry of Higher Education and Scientific Research, Algeria. (2025b). AUNEI National Report on University Business Incubators and Innovation Interfaces 2024–2025. MESRS.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education, 16*(2), 277–299. https://doi.org/10.5465/amle.2015.0026

OECD. (2012). *A Guiding Framework for Entrepreneurial Universities*. OECD Publishing. https://www.oecd.org/site/cfecpr/EC-OECD%20Entrepreneurial%20Universities%20Framework.pdf

OECD. (2024). *Venture Capital Statistics and Scoreboard 2024*. OECD Publishing. https://data-explorer.oecd.org/vis?df%5Bds%5D=DisseminateFinalDMZ&df%5Bid%5D=DSD_VC%40DF_VC_INV&df%5Bag%5D=OECD.SDD.TPS

Ranga, M., & Etzkowitz, H. (2013). Triple helix systems: An analytical framework for innovation policy and practice in the knowledge society. *Industry and Higher Education, 27*(4), 237–262. https://doi.org/10.5367/ihe.2013.0165

WIPO. (2024). Global Innovation Index 2024. World Intellectual Property Organization. https://www.wipo.int/web-publications/global-innovation-index-2024/assets/67729/2000%20Global%20Innovation%20Index%202024_WEB3lite.pdf

ACKNOWLEDGMENT

The author acknowledges the valuable institutional data made available through the AUNEI national network portal (aunei.mesrs.dz) and the Startup.dz platform maintained by the Algerian Ministry of Higher Education and Scientific Research. The author declares no conflict of interest. The views expressed are solely those of the author.