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Repositioning the Algerian University: A Triple-Pivot Model for Knowledge Economy Reform

إعادة تموقع الجامعة الجزائرية: نموذج ثلاثي المحاور للإصلاح في اقتصاد المعرفة

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Abstract: This paper proposes a reform framework for higher education in Algeria based on structural reform, student competency development, and applied humanities. It addresses challenges such as mass admissions, weak university-industry linkages, and the marginalization of humanities. Drawing on the Triple Helix, Competency-Based Education, and the Fourth-Generation University, it advocates reforming governance and admissions while strengthening innovation-oriented university platforms.

Using a conceptual-analytical approach based on SWOT analysis and source triangulation, the study presents a pilot legal innovation lab and a phased roadmap to demonstrate feasibility. It concludes that transforming Algerian universities into engines of innovation and public value requires a national vision aligned with the knowledge economy.

Keywords: Triple Transformational Pivot Model; Fourth Generation Universities; University 4.0; Knowledge Economy; University-Industry Collaboration; Higher Education Reform; Implementation Roadmap.

ملخص: تقترح هذه الدراسة إطارًا لإصلاح التعليم العالي في الجزائر قائمًا على الإصلاح الهيكلي، وتنمية كفاءات الطلبة، وتفعيل الإنسانيات التطبيقية. وتعالج تحديات رئيسية مثل الاكتظاظ الجامعي، وضعف العلاقة بين الجامعة وقطاع الصناعة، وتهميش العلوم الإنسانية. واستنادًا إلى نماذج اللولب الثلاثي، والتعليم القائم على الكفاءات، وجامعة الجيل الرابع، تدعو الدراسة إلى إصلاح أنظمة الحوكمة والقبول وتعزيز منصات الابتكار الجامعية.

واعتمدت الدراسة مقاربة تحليلية مفاهيمية قائمة على تحليل SWOT وتثليث المصادر، مع تقديم مختبر قانوني للابتكار وخارطة طريق مرحلية لإبراز قابلية التطبيق. وتخلص إلى أن تحويل الجامعات الجزائرية إلى محركات للابتكار والقيمة العامة يتطلب رؤية وطنية منسجمة مع اقتصاد المعرفة.

كلمات مفتاحية: نموذج المحاور التحولية الثلاثية، الانسانيات التطبيقية، جامعات الجيل الرابع، اقتصاد المعرفة

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1. Introduction

Higher education systems across the world have undergone radical transformations in recent decades, evolving from traditional degree-granting institutions to strategic engines of national innovation and socio-economic development (Etzkowitz & Leydesdorff, 2000). Universities are no longer peripheral actors; in successful knowledge economies such as South Korea, Finland, and Singapore, they have become key platforms for future-oriented policies, technological innovation, and economic competitiveness (Carayannis & Campbell, 2012). These institutions are increasingly structured as innovation ecosystems that blend education, research, entrepreneurship, and societal impact.

In contrast, Algeria's higher education system continues to face significant structural challenges. Although the sector has undergone substantial quantitative expansion, accompanied by a sharp increase in student enrolment exceeding 1.7 million students, concerns persist regarding the quality of training, labour-market integration, and the overall effectiveness of university outputs. This situation reflects a continuing gap between the massification of higher education and its socio-economic integration. (CRASC, 2014), The Algerian university system continues to face difficulties in moving beyond a predominantly traditional and quantitative model of higher education. Despite the implementation of the LMD reform, several structural constraints persist, including the predominance of mass enrolment, limited pedagogical transformation, and insufficient alignment between university training and socio-economic needs (Miliani, 2017) .

The central challenge facing Algerian higher education lies in the absence of a coherent and transformative institutional vision capable of positioning the university within the digital and knowledge economy. Recent reforms, including the promotion of English-medium instruction, digitalization initiatives, and the encouragement of student start-ups, have often been criticized for their fragmented implementation and limited systemic integration, raising questions about their long-term effectiveness and developmental impact (Rouaghe, F., Assassi, T., & Rahnama, M., 2025) .

Against this backdrop, the aim of this study is to propose a Triple Transformational Pivot Model (TTPM) for re-engineering Algeria's higher education system. This model integrates three interdependent dimensions: structural reform of university governance, competency-based student development, and the industrial activation of applied humanities. Drawing on theoretical frameworks such as the Triple Helix (Etzkowitz & Leydesdorff, 2000), Fourth Generation Universities (Carayannis & Campbell, 2012), and Competency-Based

Education (Chelli & Khouni, 2011), this research argues for a paradigm shift that redefines the university as a knowledge-production institution, not merely a certification hub.

Methodologically, the paper adopts a conceptual-analytical design enriched by a SWOT-based context analysis, a pilot case scenario for implementation, a risk-mitigation framework, and an explicit discussion of data-source selection and limitations. The originality of this study lies in its synthesis of multiple theoretical models to craft a context-sensitive and actionable proposal for Algeria's higher education system while acknowledging the boundaries of a non-field-tested model.

The paper is structured as follows: Section 2 reviews the global literature and key theoretical frameworks. Section 3 presents a detailed SWOT analysis of the Algerian university context. Section 4 outlines the proposed TTPM model and its application through a pilot scenario. Section 5 examines potential risks and limitations, while Section 6 concludes with key recommendations and directions for future research.

2. Literature Review / Theoretical and Conceptual Framework

This section reviews the literature and theoretical frameworks relevant to this study, highlighting the evolving role of universities, innovation governance models, competency-based education, and applied humanities, and identifies key gaps addressed by the proposed Triple Transformational Pivot Model.

2.1 The Changing Role of Universities in the Knowledge Economy

In the twenty-first century, universities have undergone a paradigmatic shift in both function and philosophy. No longer confined to credentialing, institutions in successful knowledge economies—such as South Korea, Finland, and Singapore—operate as innovation platforms embedded in national and regional ecosystems (Benner & Sandström, 2000). This transition reframes the university from a passive transmitter of knowledge to an active co-creator of socio-economic value through academic entrepreneurship, technology transfer, and public–private partnerships.

By contrast, Algeria's higher education system remains largely quantity-driven, structurally disconnected from industrial strategy and policy cycles, and centered on credentials rather than competencies or innovation outputs. Such misalignment depresses universities' developmental leverage and widens the gap between potential and realized impact, particularly in digital-industrial domains (Rouaghe, F., Assassi, T., & Rahnama, M., 2025).

Critical note: The knowledge-economy university model should not be treated as a transferable institutional recipe. In Algeria, the main analytical problem is not merely adopting global roles for universities, but creating conversion mechanisms that transform mass access, research activity, and public investment into measurable innovation capacity.

2.2 The Triple Helix Model: Bridging Academia, Industry, and Government

The **Triple Helix** (TH) model theorizes innovation as the outcome of recursive interactions between university–industry–government (U–I–G), with institutional role-overlap and hybrid organizations (Etzkowitz & Leydesdorff, 2000). Subsequent work specifies "Triple Helix systems" as policy-relevant frameworks for diagnosing innovation blockages and designing co-evolutionary interventions (Ranga, M., & Etzkowitz, H, 2013). In principle, TH invites the entrepreneurial university to co-shape regulation, markets, and technology diffusion—not merely supply human capital.

In Algeria, the Triple Helix discourse has increasingly entered public policy and higher education reforms. However, university–industry collaboration remains weak and fragmented, with interactions that are often limited and insufficiently integrated into a coherent national innovation system. Previous studies suggest that bureaucratic fragmentation and traditional approaches to technology transfer continue to hinder the development of sustainable innovation interfaces linking universities to broader economic and technological development. (Saad, M., & Zawdie, G, 2005)

Analytically, the Algerian university-government-industry relationship can be read as a statist configuration: the state remains the dominant coordinator of the other two helices, while industry demand and university autonomy remain weak. In Triple Helix terms, this limits the emergence of an entrepreneurial university because interaction is vertically steered rather than co-evolutionary (Etzkowitz & Leydesdorff, 2000).

Critical note: However, the Triple Helix model has itself been criticized for assuming a degree of functional harmony among university, industry, and government that is rarely available in peripheral or state-dominated contexts (Shinn, 2002). In the Algerian case, this critique is directly relevant; it is precisely why the TTPM adapts the model instead of reproducing it.

2.3 Fourth-Generation Universities and Systemic Innovation

Fourth-Generation Universities (4GUs) extend beyond entrepreneurialism toward platform governance: integrated innovation centers, spin-off pipelines, multi-stakeholder consortia, and mission-oriented research aligned with societal

challenges (Wissema, 2009) Such universities orchestrate transdisciplinary clusters that connect STEM, policy, and design.

Algerian references to "startup universities" have not matured into institutional architectures: incubators often exist in form, not function; LegalTech and policy-innovation units are rare; and many "startup graduation projects" display limited novelty or scalability, signaling weak academic–industry coupling and under-developed governance for innovation (Rouaghe, F., Assassi, T., & Rahnama, M., 2025).

Critical note: The 4GU/University 4.0 literature may overestimate the presence of dense innovation ecosystems, venture finance, and institutional autonomy. For this reason, the TTPM uses 4GU as a horizon of reform, not as a ready-made template for Algeria.

2.4 Competency-Based Education (CBE): From Knowledge Transfer to Skills Empowerment

CBE reframes curricula around explicit, measurable competencies, shifting assessment from recall to performance in authentic contexts and improving employability alignment (Aït Haddouchane, Amirat, & Boudiba, 2017). Effective CBE requires program-level outcome maps, criterion-referenced assessment, and faculty development. While Algeria has **f**ormally embraced CBE, implementation remains surface-level: competency maps are under-specified, assessments revert to rote testing, and staff development in CBE design is limited—perpetuating a graduate–labour market mismatch in the digital economy (Chelli & Khouni, 2011)

Critical note: CBE can also become a bureaucratic vocabulary of outcomes if assessment systems, staff incentives, and external validation remain unchanged. The TTPM therefore links competencies to portfolios, partner feedback, and applied outputs rather than to curriculum documents alone.

2.5 Applied Humanities: The Neglected Catalyst of Innovation

Globally, applied humanities contribute to AI ethics, behavioral design, policy innovation, human-centered interfaces, and cultural/creative industries. International agendas now emphasize a science–humanities alliance to steer digital transitions responsibly (Humanities for the future: Rethinking the role of the humanities in digital transformation, 2022). Within mature ecosystems (e.g., Germany, the Netherlands), humanities collaborate with STEM fields in legal informatics, digital constitutionalism, and responsible innovation.

In Algeria, humanities and social sciences remain marginalized and abstracted from market and policy realities, missing opportunities in digital inclusion, cultural entrepreneurship, and evidence-informed regulation—despite their potential to

shape demand-side adoption, ethical guardrails, and institutional trust.

Critical note: The humanities cannot become "applied" by declaration alone. Their policy relevance depends on interdisciplinary mandates, credible external demand, and outputs that can be used by courts, ministries, firms, and civic actors.

2.6 Identifying the Research Gap

Algerian scholarship often imports global models normatively or diagnoses academic problems in isolation from industrial policy and governance. Missing is a composite framework that fuses (i) structural reform of university governance (TH/4GU logics), (ii) competency-based pedagogy, and (iii) applied humanities for regulatory and design capacity—especially within law and social science faculties as policy-shaping hubs.

This study addresses that gap by proposing a Triple Transformational Pivot Model that integrates (1) governance redesign for innovation roles, (2) CBE program architectures for labor-market and innovation alignment, and (3) applied-humanities units for policy, ethics, and digital governance. Rather than transplanting models, the framework re-codes them to Algeria's institutional and cultural specificities, offering a scalable, phased roadmap for system-level change.

2.7 Recent Research Positioning and Added Value

Recent studies on University 4.0 in Algeria confirm that digital transformation cannot be reduced to platforms or administrative modernization. It requires simultaneous structural, pedagogical, and policy reform capable of bridging the gap between education, industry, and economic development (Dou, 2025). Likewise, recent work on post-pandemic online education in Algeria highlights persistent problems of infrastructure, digital skills, pedagogy, assessment, and student motivation, which suggests that transformation must be institutional rather than merely technological (Dou, A.; Khattala, A.; Taibi, H., 2026).

This recent literature strengthens the relevance of the TTPM by showing that Algerian universities need a coordinated architecture linking governance, competency formation, and applied knowledge. It also reinforces the contribution of the present article: instead of diagnosing digitalization or employability as isolated issues, it proposes an integrated model that connects policy, pedagogy, and humanities-based innovation within a phased implementation plan.

Critical note: Recent Algerian studies remain more diagnostic than operational. Their contribution to this article is therefore not only evidentiary but also problem-forming: they identify the transformation gaps that the TTPM converts into an institutional design.

3. Context and Problem Statement

3.1 The Algerian Higher Education Landscape: Structure and Challenges

With over 1.7 million students enrolled across over 100 universities and higher education institutions, Algeria boasts one of the largest university networks in the MENA region (Réseau universitaire, 2025). Since independence, successive governments have invested significantly in expanding access to higher education as a tool for social mobility and national development. Public universities exist in all 58 wilayas (provinces), with tuition-free education and relatively inclusive access criteria.

However, the quantitative expansion of higher education in Algeria has not always been accompanied by equivalent improvements in institutional performance or socio-economic integration. Previous studies have highlighted persistent challenges related to graduate employability, limited research effectiveness, and weak university–industry collaboration (CRASC, 2014; Miliani, 2017; Saad, M., & Zawdie, G, 2005).The gross mismatch between university output and labor market demands has led to a saturated academic system, producing credentials with diminishing economic value.

Structurally, the system remains over-centralized, governed by ministerial decrees and administrative hierarchies that leave little room for institutional autonomy or innovation. The internal governance of many universities is marked by non-transparent decision-making and limited academic freedom, leading to what Altbach (2005) describes as "closed academic elites" that resist reform and isolate creative voices.

3.2 Policy Attempts and Their Structural Limitations

In recent years, Algeria has launched a series of reform initiatives aimed at modernizing its university system. These include:

- The 2022 ministerial decision no. 1275, linking final-year graduation projects to startup incubation.
- Anglicization of some university streams, in an effort to internationalize programs.
- Integration of digital platforms for administrative and pedagogical use.

While commendable, these initiatives remain unevenly implemented and are not yet fully embedded in a comprehensive transformation strategy. Ministerial Decision No. 1275 has encouraged the “degree-start-up” and “degree-patent” logic, while recent official decisions creating university incubators indicate a more favorable legal environment for university-based innovation. However, the underlying model of the university-as a state-run credentialing entity-often remains

intact unless these measures are linked to governance reform, curriculum redesign, and measurable innovation outputs (Arrêté ministériel n° 1275 du 27 septembre 2022 relatif au mécanisme diplôme-start-up / diplôme-brevet, 2022; Journal officiel de la République algérienne démocratique et populaire, n° 41, 12 juin 2024: Arrêtés interministériels du 18 janvier 2024 portant création de services communs de recherche « Incubateur » au sein des universités, 2024).

Moreover, applied humanities and social sciences, which are increasingly vital globally in digital governance and socio-technical design, remain marginalized in Algeria. Taught abstractly and disconnected from public policy or economic strategy, these fields represent a lost opportunity for knowledge-based development and legal-technical foresight.

3.3 Institutional Blockages: Beyond Finance

Contrary to common assumptions, the crisis of Algerian higher education is not primarily a question of funding or infrastructure. Instead, the problem lies in the absence of a functional identity for the university: What role should it play in national development? Is it a site of knowledge production, or merely a distribution channel for social credentials? Is it empowered to lead economic transformation, or relegated to following state directives?

Several studies on Algerian higher education have highlighted the persistence of bureaucratic and traditional institutional practices that limit the university's developmental and innovative role. Researchers point to weak research integration, limited interdisciplinary collaboration, and insufficient engagement with socio-economic actors, despite successive reform initiatives. In this context, the effectiveness of higher education reforms continues to be constrained by structural and governance-related challenges rather than merely technical deficiencies.

3.4 Problem Statement and Research Questions

This study builds on the premise that Algeria's higher education system is in need of a transformational, not incremental shift—one that reimagines the university as a strategic actor in economic and policy innovation. It hypothesizes that such a transformation requires integrating three neglected dimensions:

1. Structural reform of university governance and orientation (beyond quantity to mission).
2. Empowerment-based pedagogy rooted in competencies and employability.
3. Repositioning of applied humanities as tools of strategic foresight in digital governance.

Accordingly, the central research question is:

How can Algerian universities adopt a triple-pivot transformation model that

redefines their identity and function to become institutional platforms for knowledge-driven economic development?

This question is addressed through three guiding propositions:

- **GP1:** The crisis of Algerian higher education is rooted not only in financial or administrative dysfunction but in the lack of a transformative institutional philosophy.
- **GP2:** A Triple Transformational Pivot—combining structural reform, competency-based pedagogy, and applied humanities—can realign universities with national innovation agendas.
- **GP3:** Symbolic reforms and pilot initiatives will remain ineffective unless embedded in a coherent institutional and policy framework

4. Research Design and Methodology

This study adopts a theoretical-analytical and conceptual design methodology grounded in constructive policy research. Rather than testing pre-defined causal hypotheses through primary empirical data collection, the research aims to develop a contextually relevant transformation model for Algerian higher education. This choice is deliberate: the article functions as a model-building and policy-design study, not as an impact-evaluation study. Its claims are therefore analytical and prescriptive, and the need for subsequent empirical validation is explicitly acknowledged.

4.1 Conceptual and Analytical Orientation

The methodological foundation of this study draws upon:

- The Triple Helix Model of university-industry-government interaction (Etzkowitz & Leydesdorff, 2000);
- The concept of Fourth-Generation Universities and University 4.0 (Wissema, 2009; Dou, 2025);
- The framework of Competency-Based Education (CBE) (Aït Haddouchane, Amirat, & Boudiba, 2017);
- Emerging discourse on applied humanities, technological innovation, and human-centered digital governance (Humanities for the future: Rethinking the role of the humanities in digital transformation, 2022; Tawil & Miao, 2024).

These concepts are not merely discussed abstractly but are integrated to construct what this paper proposes as a **"**Triple Transformational Pivot Model**"** (TTPM) — a strategic framework for redesigning university structure, pedagogy, and societal function.

4.2 Analytical Tools and Structure

The study relies on a multi-layered set of analytical instruments:

- Critical literature review, to assess the applicability and gaps of international models in the Algerian context;
- SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), to map the internal and external landscape of Algerian universities;
- Scenario building, particularly the development of a pilot implementation scenario applied to law faculties, aimed at operationalizing the TTPM model;
- Risk matrix, to anticipate institutional challenges and propose preemptive mitigation strategies for sustainability.

The approach is inherently design-oriented and problem-solving, seeking to bridge conceptual models with practical institutional transformation. This is in line with policy research paradigms that aim not only to interpret reality but to reshape it.

4.3 Case-Oriented Scenario Design

To test the feasibility of the proposed transformation model, the study includes a pilot implementation scenario situated within a typical Algerian law faculty. This scenario involves the creation of an "Innovative Legal Design Lab" aimed at transforming legal education into a production-oriented, digitally-integrated policy laboratory. While not an empirical case study in the classical sense, this scenario is used as a strategic simulation tool, grounded in institutional reality but extrapolated toward a normative vision.

4.4 Data Sources, Selection Logic, and Reliability

To address the methodological limitations associated with secondary-source research, the study relies on a transparent and triangulated evidence base. Sources were selected according to four criteria: relevance to Algerian higher education reform, recency where current policy or digital transformation is discussed, conceptual usefulness for model construction, and reliability of institutional or peer-reviewed origin. The corpus combines official regulatory texts, national policy references, peer-reviewed Algerian and international scholarship, and comparative innovation-governance literature.

The absence of interviews, surveys, or field experiments is therefore not an accidental omission but a methodological boundary consistent with a conceptual policy-design article. Nevertheless, it limits the ability to measure stakeholder readiness, causal effects, or implementation outcomes. For that reason, the article proposes field validation through pilot implementation, longitudinal monitoring, and mixed-method evaluation in future research.

Source category	Selection criterion	Analytical role	Reliability control
Official policy and regulatory texts	Direct relevance to Algerian higher education reform and innovation policy	Identify institutional opportunities, legal constraints, and	Preference for ministerial or Official Journal sources;

		implementation levers	cross-checking with academic literature
Peer-reviewed Algerian studies	Recent work on University 4.0, digitalization, employability, and university-industry links	Update the state of the art and locate the model within current national debates	Use of indexed or journal-published studies when available
International frameworks and literature	Conceptual relevance to Triple Helix, competency-based education, human-centered digital education, and university-industry collaboration	Build the theoretical architecture and comparative lens	Use of established academic and institutional sources
Scenario and risk analysis	Institutional plausibility and relevance to law faculties and applied humanities	Translate the model into an implementable pilot and scale-up pathway	Scenario treated as a simulation, not as empirical proof

4.5 Scope and Limitations

While this study provides a detailed analytical and conceptual model, it does not include primary empirical data such as interviews, surveys, direct observation, or statistical regressions. Its strength lies in diagnostic synthesis and model construction, rather than quantitative validation. The proposed model should therefore be understood as a theoretically grounded and policy-relevant framework awaiting empirical testing.

Other limitations include:

- Context specificity: The findings are primarily tailored to the Algerian context. However, the model may be transferable to other emerging higher education systems characterized by centralized governance, massification, graduate-employability pressures, and weak university-industry linkages.
- Dependence on secondary data: Reliance on national reports, regulatory texts, academic literature, and expert assessments may constrain empirical depth. To reduce this limitation, the study triangulates sources and distinguishes clearly between evidence-based diagnosis, conceptual inference, and normative proposal.
- Implementation gap: While the model is theoretically actionable, actual adoption depends on institutional willingness, political support, administrative coordination, stakeholder incentives, and sustainable financing-factors that require empirical monitoring beyond the scope of this article.

5. Findings and Discussion

This section presents the main findings emerging from the institutional analysis of Algeria's higher education system. The SWOT diagnosis is not used as a merely descriptive inventory; it is interpreted as a set of interacting conditions that explain why previous reforms often remain symbolic. The central analytical finding is that Algeria possesses a broad institutional base and emerging policy openings, but these assets are weakened by governance rigidity, fragmented implementation, and weak conversion of academic knowledge into social and economic value.

5.1 Structural Strengths: A Potential Platform for Change

Despite systemic limitations, Algeria's higher education system possesses foundational strengths:

- Extensive geographical coverage: With public universities in all 58 provinces, Algeria has a vast institutional footprint that can support regional development.
- A critical mass of students: With over 1.7 million enrolled students, the country has a demographic dividend capable of supporting knowledge-based economic transition.
- Legal openness to innovation: Policies such as Ministerial Decree 1275 linking graduation to start-up incubation signal a tentative institutional openness to reform
- Selective research capacity: Certain technical and engineering faculties have demonstrated competence, albeit in isolated fashion, and without systemic integration.

These factors suggest that, while reform will be challenging, the institutional substrate exists to support transformative change — if harnessed strategically.

5.2 Deep-Rooted Weaknesses: Cultural and Institutional Rigidities

Findings from the literature and policy analysis point to entrenched weaknesses that undermine the university's developmental role:

- Absence of a strategic vision: Universities operate without a clear developmental mission, disconnected from national economic or industrial priorities.
- Closed governance cultures: Informal power networks and administrative routines often dominate academic decision-making, limiting transparency, meritocratic mobility, and experimentation.
- Traditional pedagogy: Teaching remains didactic and exam-driven, failing to develop critical, collaborative, digital, and entrepreneurial skills necessary for the knowledge economy.
- Instrumental view of research: Research is often performed to meet

promotion requirements, with limited social or economic impact (Miliani, 2017).

- Graduate unemployment: A mismatch persists between academic programs and labor market demands, especially in the humanities and social sciences.
- Top-down university governance: Decisions are made hierarchically, with minimal stakeholder involvement and weak accountability mechanisms.
- Marginalization of the humanities: Humanities disciplines are structurally disconnected from innovation systems, despite their global role in design, ethics, and tech governance (Humanities for the future: Rethinking the role of the humanities in digital transformation, 2022).

These findings reveal not only technical shortcomings but a crisis of institutional identity, where the university remains peripheral to national transformation agendas.

5.3 Opportunities and Strategic Leverage Points

Notwithstanding these constraints, several opportunities exist:

- Global shift to digital economies: Algeria can leapfrog into the fourth-generation university model without replicating outdated industrial stages.
- Untapped national assets: Fields such as renewable energy, desert agriculture, and cultural industries offer promising research niches.
- Diaspora expertise: Highly skilled Algerians abroad may be engaged—virtually or physically—to strengthen reform capacity.
- Policy momentum: The state's growing emphasis on digitization and start-ups opens a policy window, albeit fragile and inconsistently implemented.

5.4 Systemic Threats and Risks

Conversely, certain threats must be acknowledged:

- **Credential inflation**: Massification of higher education has devalued degrees, reducing their signaling power in the job market.
- **Symbolic reforms**: Many innovations remain superficial, creating the illusion of progress without structural change.
- Brain drain: Talent loss remains a chronic issue, with limited incentives for researchers to remain, return, or collaborate with domestic universities.
- **Innovation dependency**: Without local innovation systems, Algeria risks permanent technological dependency on external actors.

5.5 Comparative Reflection: Algeria and Global Trends

Compared to transformation processes in countries such as South Korea, Finland, and Singapore, Algerian universities lag behind in aligning institutional missions with national strategies. While these countries embedded universities within national innovation ecosystems, Algerian reforms remain fragmented and frequently symbolic. This contrast highlights the need for philosophical and

structural realignment, not just technical interventions.

Moreover, unlike successful models where applied humanities contribute to technological design, ethical regulation, and governance innovation, Algerian humanities remain isolated from policy influence or economic contribution. This reveals a missed opportunity to leverage interdisciplinary knowledge in shaping Algeria's digital and industrial future.

A focused comparator is useful here. Malaysia is not presented as a fully transferable model, but as a case where higher education digitalization has been articulated through dedicated policy instruments and action plans (Digitalization of Higher Education Policy 2025-2030, 2025). The comparison below is limited to one axis: the institutional activation of applied and digital competencies across non-technical fields.

Comparison axis	Algeria	Malaysia / TTPM lesson
Policy architecture	Fragmented reform instruments across decrees, platforms, and pilots.	Dedicated digital higher-education policy/action plans; TTPM needs one integrated framework.
Applied humanities	Mostly theoretical and weakly linked to digital public services.	Non-technical fields are included in digital transformation; TTPM links humanities to LegalTech, ethics, and policy design.
Industry interface	Emerging incubators and uneven partnerships.	Lesson: formal councils, labs, and partner deliverables must be institutionalized.
Evaluation logic	Input-based metrics: enrolment, degrees, compliance.	Outcome dashboard: employability, prototypes, policy briefs, and partnership continuity.

Analytical synthesis: The SWOT diagnosis suggests that Algeria's core problem is not the absence of reform initiatives but the absence of conversion mechanisms. Policies, digital platforms, incubators, and start-up rhetoric generate limited impact when they are not connected to autonomous governance, competency-based curricula, reliable industry partnerships, and measurable societal outputs. The TTPM therefore functions as a conversion framework: it seeks to turn existing institutional mass into developmental capacity.

6. Proposed Transformational Model and Pilot Scenario

6.1 The Triple Transformational Pivot Model: A Conceptual Overview

Based on the theoretical insights and the diagnostic findings, this paper proposes the Triple Transformational Pivot Model (TTPM) to re-engineer the Algerian university system. The model is built on the integration of three strategic dimensions:

1. Institutional Restructuring: Reforming university governance and admissions policies to enable autonomy, innovation, and alignment with national economic priorities.

2. Competency-Based Learning: Replacing rote education with a competency-oriented framework that equips students with skills in design thinking, digital fluency, and entrepreneurial capacity.

3. Applied Humanities as Digital Levers: Reconceptualizing the role of the humanities and social sciences as tools for technological governance, ethical regulation, and public innovation.

This triadic model creates a shift from the current status quo — where universities act as credentialing agencies — towards dynamic, innovation-driven institutions embedded within national development ecosystems.

6.2 Pilot Scenario: Legal Innovation and Smart Legislation Laboratory

To operationalize the TTPM, this study proposes a pilot intervention titled "The Legal Innovation and Smart Legislation Lab", to be launched in a law faculty of a mid-sized Algerian university. The pilot is not presented as proof of effectiveness; rather, it is a structured simulation that translates the model into an institutional experiment capable of later field testing.

This scenario seeks to transform the law school from a theoretical, lecture-based institution into a hub for legislative innovation, contributing to the digital and regulatory frameworks of Algeria's emerging knowledge economy.

Why law faculties specifically? First, institutionally, Algerian law faculties graduate large cohorts into a saturated public and legal labour market, which creates stronger internal pressure for curricular renewal than in more technically absorbed disciplines. Second, technically, digital governance and smart legislation naturally require cooperation between jurists, data specialists, public administrators, and software developers; LegalTech is therefore a genuine meeting point rather than an artificial add-on. Third, politically, Algeria's justice-modernization trajectory creates concrete institutional demand for tools related to electronic procedures, digital legal documentation, online services, and regulatory foresight (Organisation d'une journée d'étude sur la transformation numérique dans le secteur de la justice et son rôle dans l'amélioration du travail judiciaire, 2025). This gives the pilot external legitimacy: it responds to an existing public-sector transformation agenda, not merely to an academic desire for novelty.

Objectives of the Pilot

- Redefine the functional role of legal education as a contributor to national legislative innovation.
- Equip students with hybrid competencies: legal analysis, digital regulation, and innovation management.
- Generate applied legislative tools to support state institutions (e.g.,

Ministries of Justice, Digitization, and Start-Ups).

- Position the law faculty as an institutional actor in public policy design and smart governance.

Components of the Scenario

Dimension	Intervention
Pedagogy	Introduction of a new applied module: “Law and Digital Innovation”, integrating LegalTech, economic regulation, and AI policy.
Institutional	Establishment of an on-campus innovation lab focused on experimental law and regulatory foresight.
Partnerships	Strategic collaboration with: Ministry of Justice, Ministry of Digitization, National Start-up Agency, private sector LegalTech firms.
Outputs	Prototype legislative proposals, digital legal tools (e.g., AI-assisted interpretation engines), and policy reports.

Work Plan

Phase	Duration	Key activities	Expected outcomes
Setup phase	3 months	Needs assessment, team formation, MoUs, curriculum design, baseline indicators	Pilot approval and baseline indicators
Faculty pilot	1 academic year	Teaching, challenge-based learning, legal-policy prototyping, partner mentoring	Validated prototypes and competency evidence
Cross-faculty replication	Year 2	Adapt the lab model to humanities, economics, engineering, and social sciences	Interdisciplinary innovation clusters
Regional scaling	Years 3-4	Create regional innovation councils and align labs with local economic priorities	Scalable partnerships and regional innovation outputs
National institutionalization	Year 5+	Adopt national rules for applied humanities labs, indicators, funding, and quality assurance	System-wide rollout and continuous evaluation

6.3 Feasibility and Transformational Potential

The proposed scenario is distinguished by four core features:

• Originality: This is the first initiative of its kind in Algeria or North Africa, introducing LegalTech as a structured academic pathway.

• Transformational Value: It redefines legal education as a tool for socio-economic change and governance innovation.

• Feasibility: The pilot requires no major infrastructural investment at the initial stage; it depends mainly on curricular redesign, partnership agreements, staff

development, and institutional commitment.

- Strategic Alignment: The scenario supports national goals such as judicial digitalization, start-up regulation, and public service innovation.

6.4 Challenges and Mitigation Strategies

While promising, the pilot faces potential constraints:

- Institutional resistance: Change agents (faculty and students) must be empowered and incentivized.
- Skill gaps: Staff development and external expertise will be crucial.
- Policy ambiguity: Institutional coordination mechanisms must be clarified through formal agreements.
- Funding: Joint financing mechanisms with public and private actors should be pursued, including competitive seed funds, partner sponsorships, and integration into national or international innovation programs.

6.5 System-Wide Implementation Roadmap

To respond to the scalability concern, the TTPM should be implemented through a phased national roadmap rather than through isolated pilot projects. The roadmap begins with faculty-level experimentation, moves to cross-faculty replication, and then becomes institutionalized through national governance, funding, and evaluation mechanisms.

The roadmap also requires a national evaluation dashboard. Suggested indicators include graduate employability, number of policy briefs delivered to public institutions, number of prototypes reaching incubation, partnership continuity, student competency portfolios, and the proportion of humanities and social science programs with applied or digital components.

To make this dashboard auditable, the roadmap should translate broad objectives into annual indicators that can be tracked before and after implementation:

- Share of law, humanities, and social science graduates placed in LegalTech, digital public administration, compliance, policy analysis, or related innovation roles within 12 months.
- Number of legislative proposals, policy briefs, or regulatory-impact notes produced by university labs and formally transmitted to public institutions within two academic years.
- Number of student prototypes reaching incubation, partner testing, or public-service experimentation.
- Continuity rate of partnerships, measured by MoUs that generate at least one joint activity or deliverable per year.
- Percentage of redesigned modules assessed through competency portfolios,

challenge-based assignments, or external jury evaluation.

- Student and partner satisfaction scores collected through standardized surveys at baseline, midline, and endline.

Level	Main action	Responsible actors	Monitoring indicators
Faculty level	Launch applied innovation labs and redesign selected modules around competencies and challenge-based learning	Faculty dean, lab coordinator, partner mentors	Number of modules redesigned; student projects; partner participation
University level	Create a university innovation council linking incubators, faculties, research centers, and external partners	Rectorate, incubator, quality assurance unit	MoUs signed; prototypes incubated; interdisciplinary projects
Regional level	Align university labs with regional economic priorities such as desert agriculture, renewable energy, digital public services, cultural industries, and LegalTech	Universities, wilaya authorities, socio-economic partners	Regional innovation projects; local policy briefs; employment-oriented outputs
National level	Adopt a regulatory and funding framework for applied humanities, competency-based curricula, and innovation outputs	MESRS, sectoral ministries, national agencies	Funding allocations; quality assurance criteria; national transformation indicators

7. Risks and Limitations

Transformational reform in higher education—especially within traditional institutional contexts—inevitably encounters a range of risks and structural limitations. The success of the Triple Transformational Pivot Model (TTPM) hinges not merely on its theoretical soundness but also on the institutional readiness, political will, and cultural adaptability of universities and stakeholders.

7.1 Institutional and Cultural Resistance

One of the primary risks is internal resistance from faculty and administrative elites, especially those who perceive innovation as a threat to established norms, privileges, or academic routines. This cognitive inertia has been well documented in similar reform attempts across the Global South (Altbach, 2005). In Algeria, such resistance may manifest in low participation, passive obstruction, or symbolic co-optation of reform rhetoric without actual behavioral or institutional change.

Mitigation strategy: Involve resistant actors early in the design phase, link participation to incentives (promotion, project funding), and showcase quick wins

to shift the institutional narrative from fear to opportunity.

7.2 Skill and Capacity Gaps

A second structural constraint lies in the limited capacity to implement cross-disciplinary innovations, especially in areas like LegalTech, competency-based education, and digital regulation. Many academic staff lack the training or exposure to lead such transformations, which may result in superficial adoption or poor pedagogical delivery.

Mitigation strategy: Launch targeted capacity-building programs, leverage diaspora expertise through hybrid teaching, and establish co-teaching teams with private sector professionals.

7.3 Bureaucratic and Governance Ambiguity

There exists uncertainty regarding the distribution of authority between universities, ministries, and affiliated institutions, especially when it comes to launching new experimental units or engaging with non-academic stakeholders. This bureaucratic fuzziness can delay implementation, limit innovation space, or lead to overlapping mandates.

Mitigation strategy: Establish a clear legal and institutional framework through ministerial agreements or pilot university charters, and assign a formal innovation coordinator within the university's governance structure.

7.4 Political or Symbolic Exploitation

There is also the risk of political co-optation, where the vocabulary of innovation and transformation is used for symbolic gains—media campaigns, reputational enhancement—without real structural change. In such cases, the pilot could become a PR tool rather than a reform engine.

Mitigation strategy: Anchor the project in a scientific governance model, led by an independent committee with transparent metrics, peer-reviewed reporting, and publicly shared impact indicators.

7.5 Financial Uncertainty

While the proposed pilot scenario is financially light in infrastructure, there remain uncertainties regarding sustainable funding for innovation labs, training, and project incubation. In fragile economic contexts, such uncertainties can undermine continuity and credibility.

Mitigation strategy: Mobilize hybrid funding mechanisms (public-private partnerships), integrate the project into national and international innovation programs (e.g., Erasmus+, Horizon Africa), and seek local private sector sponsorships.

7.6 Structural Limitations of the Study

This study is conceptual in nature and primarily theoretical. While the proposed scenario draws on real institutional dynamics, it has not yet undergone field validation. This is the study's most important limitation: the model's internal coherence does not automatically prove its operational effectiveness. Additionally, limited access to internal ministerial data, funding policies, unpublished university reform reports, and stakeholder perceptions imposes analytical limits.

Future work should focus on:

- Empirical pilot implementation and longitudinal monitoring.
- Student and faculty surveys to gauge attitudes and readiness.
- Impact assessments of existing innovation initiatives in Algerian universities

7.7 Transferability and Field Validation

Although designed for Algeria, the TTPM may be analytically relevant for comparable emerging higher education systems facing massification, centralized governance, graduate underemployment, and weak university-industry linkages. However, transferability should not be assumed mechanically. Future comparative research should examine how the model performs under different governance cultures, funding capacities, labor-market structures, and levels of institutional autonomy.

Field testing should proceed through mixed methods: baseline surveys of students and faculty, interviews with administrators and socio-economic partners, monitoring of pilot outputs, and longitudinal tracking of graduate trajectories. This would transform the present conceptual model into an empirically evaluated reform instrument.

Conclusion and Recommendations

This study has proposed a transformative model-the Triple Transformational Pivot-for repositioning Algerian higher education as a central actor in knowledge-based economic development. It departed from the premise that the persistent inefficiency of Algerian universities is not merely technical or administrative, but stems from a lack of strategic vision regarding the university's functional identity within national development.

The key conclusion is that Algerian universities continue to operate below their potential in the logics of innovation, digital economy, and structural value creation. The analysis shows that Algeria has important assets: territorial coverage, student mass, emerging incubator policies, and a growing reform discourse. Yet these assets remain under-converted into developmental outcomes because governance, curricula, partnerships, and evaluation systems are not sufficiently integrated.

The proposed Triple Pivot Model reconceptualizes the university around three

strategic axes: (1) structural reengineering of institutional governance and admission systems, (2) student competency as the core output of education, and (3) applied humanities as a catalyst for innovation in legal, digital, and societal domains. The pilot scenario on legal innovation laboratories exemplifies how transformation can begin at faculty level, while the added system-wide roadmap clarifies how it may expand into a national reform architecture.

Critically, the model should not be read as a ready-made solution that can succeed by decree. Its effectiveness depends on implementation conditions: incentives for academic staff, reliable partnerships, transparent governance, stable funding, and measurable outcomes. Without these conditions, the language of innovation may reproduce the same symbolic reform pattern that the article critiques.

From a policy standpoint, the study recommends:

1. Establishing a national vision for higher education as a driver of sovereign knowledge and digital transformation.
2. Reforming university governance, granting more autonomy with accountability mechanisms, especially in partnership-building and innovation management.
3. Creating interdisciplinary innovation labs in faculties of humanities, law, and social sciences, to bridge academic knowledge and economic application.
4. Institutionalizing partnerships between universities, government agencies, and private sectors via dedicated innovation councils.
5. Revamping academic evaluation systems, linking promotion and funding to measurable societal and economic outcomes rather than administrative longevity.

Furthermore, future research should empirically test the model through pilot implementation in different faculties and regions, including student and faculty surveys, interviews with institutional actors, longitudinal monitoring of lab outputs, and comparative analysis with other African or emerging economies. Such research would assess the transferability of the Triple Pivot framework and contribute to a Global South perspective on higher education reform.

It is equally vital to develop national indicators for university transformation-tracking innovation outputs, graduate employability, interdisciplinary impact, policy contributions, and partnership continuity-to replace outdated input-based metrics.

Finally, this paper calls for a shift in how universities are perceived and managed. The university must move from being a reactive actor receiving top-down directives, to a sovereign cognitive institution, actively shaping public policy, economic strategy, and national identity.

Ultimately, the shift from university as a passive institution to university as a state-

shaping actor is not optional; it is imperative. The road to a productive and sovereign knowledge economy in Algeria passes through its universities, not around them.

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