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Transition from traditional university to entrepreneurial university in Algeria: Mechanisms and requirements, theoretical rooting entrepreneurial university

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***Abstract*---**The article explores the transformation of traditional universities into entrepreneurial universities in Algeria, emphasizing the mechanisms and prerequisites necessary for this transition. It highlights the critical role of universities in adapting to a knowledge-based economy, where strong collaboration with industrial and governmental sectors is essential. This shift aims to redefine universities as engines of economic growth, facilitators of knowledge commercialization, and drivers of job creation, aligning with the "Triple Helix" model, which promotes integration among academia, industry, and government. The article outlines key objectives, including fostering an entrepreneurial mindset among students and faculty, promoting innovation, diversifying funding sources, and expanding the role of universities in community development. It identifies significant challenges, such as inadequate infrastructure, resistance to change, and limited industry collaboration. In its conclusion, the article offers recommendations for successful transformation, emphasizing the importance of cultivating an entrepreneurial culture, building strategic alliances, and restructuring academic programs to prioritize self-employment and the development of entrepreneurial skills.

***Keywords*---**Entrepreneurial University, Knowledge Economy, Innovation, Triple Helix Model, Entrepreneurship Education, Knowledge Transfer, Entrepreneurial Culture, Market-Driven Research, Competitive Advantage.

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Introduction

The rapid changes in global competitive forces in an era dominated by knowledge as the producer of value have led to increasing needs of market actors, especially those reliant on information technology and communication. This has shifted the principle of conflicts in the world from an ideological struggle based on competition and the search for new markets to an economic conflict based on speed in innovation, initiative in creativity, and genuine partnership with stakeholders.

Research Problem:

Considering universities as the primary representatives of scientific leadership and entrepreneurship in society, for the production, dissemination, investment, and marketing of knowledge, and the development of human capabilities qualified to deal with the data of scientific and technological progress upon which social and economic development plans rely, they have become obligated to adapt to the evolving and dramatic contemporary developments surrounding their environment. This has brought about a fundamental change in their concept, roles, and patterns of adaptation, compelling them to seek new formulas and models that respond to the variables of this age in order to regain their vitality and ability to fulfill their expected roles in the knowledge era. One of the most prominent of these formulas is the entrepreneurial university, which emerges as one of the most important innovative formulas that reflect the university's response to its changing environment in a highly complex globalized world, calling for the establishment of a knowledge-based economic development system. Through the discussion of the transformations universities undergo in finding a new formula based on entrepreneurship and knowledge valorization, we can pose the following research problem:

- What are the requirements for transitioning from a traditional university to an entrepreneurial university?

From this main problem, the following questions branch out:

- What is the philosophy underlying the entrepreneurial university?
- What are the goals of the entrepreneurial university?
- What is the reason for the shift towards the entrepreneurial university?
- What are the requirements for achieving the entrepreneurial university?

Research Objectives:

Within the framework of the posed problem, this study aims to achieve the following:

- Provide the conceptual framework for the entrepreneurial university.
- Present the historical context through which the concept of the entrepreneurial university has evolved.
- Highlight the importance and goals that the entrepreneurial university seeks to achieve.
- Identify the main reasons prompting the transition towards the entrepreneurial university model.

- Understand the requirements for adopting the approach of the entrepreneurial university.
- Finally, shed light on the key differences between traditional universities and entrepreneurial universities.

Research Methodology:

To address the posed problem, a descriptive methodology was followed, which is suitable for the nature of the theoretical study aiming to provide theoretical grounding regarding the entrepreneurial university, understand its origins, dimensions, and necessary requirements for adoption, in order to extract the most prominent facts and results related to the subject.

Previous Studies:

- Abderrahman Hassan Ismail's study (2022), "Requirements for Implementing the Entrepreneurial University at Taiz University," published in the Journal of Educational Sciences and Humanities, aimed to identify the requirements of the entrepreneurial university at Taiz University. Through understanding the concept of the entrepreneurial university in terms of its requirements and implementation, the study utilized a descriptive approach with a Delphi methodology, employing a questionnaire composed of seven dimensions distributed among a sample of 67 individuals. The study concluded on the positive orientation towards the entrepreneurial university, emphasizing the importance of developing strategies and implementation plans to reconsider educational programs and build infrastructure to support this.

- Saad Bin Zuaar Al-Hajhouj Al-Qahtani's study, "Global Entrepreneurship Requirements in Saudi Universities to Achieve Competitive Advantage in Light of the Kingdom's Vision (2030)," published in the Scientific Journal of the College of Education at Asyut University, aimed to uncover the global entrepreneurship requirements in Saudi universities to achieve competitive advantage in line with the Kingdom's future vision. The study concluded that there is a need to focus on creating employment opportunities and partnerships with stakeholders to ensure the university's outputs.

- Adnan Abdullah Suleiman Al-Shaheeha's study, "Application of the Concept of the Entrepreneurial University: Princess Nourah bint Abdulrahman University Example," published in the Arab Journal of Administration, aimed to assess the availability of entrepreneurial university dimensions at Princess Nourah bint Abdulrahman University as a model of Saudi universities aspiring to become entrepreneurial universities. The study utilized a questionnaire distributed among a sample of 309 university faculty members, concluding that despite facing obstacles and challenges, the study sample agreed on applying entrepreneurial university dimensions.

- The study on the effectiveness of entrepreneurial universities: Experiences and Challenges in the Digital Age aimed to identify the effectiveness of entrepreneurial universities through literature reviews related to entrepreneurial universities, international organization reports, and recognized research centers. Several

indicators of entrepreneurial university performance efficiency were reviewed, including future vision, leadership, innovation and creativity, entrepreneurial employees, and entrepreneurial education.

- Radko, Belitski, and Kalyuzhnova's study aimed to explain the requirements of the entrepreneurial university from the perspective of internal and external stakeholders and their impact on entrepreneurial university outcomes. The study developed a theoretical model and empirically tested it on three types of universities (Russell Group, teaching-based, and polytechnic universities), concluding the significant importance of stakeholders' role in achieving the entrepreneurial university.

- Feola, Parente, and Cucino's study aimed to identify the concept of the entrepreneurial university according to Etzkowitz's Triple Helix model, adding traditional university missions (education and research) to contribute to economic development by transferring scientific research results from university laboratories to the university's external environment (economic and industrial system). The study also aimed to study the relationship between universities' entrepreneurial orientation and the influencing factors, whether internal or external to the university environment.

First: Theoretical Grounding

In this part of the study, we will cover various concepts that have contributed to shaping the pioneering university and narrate the historical context through which it has evolved to reach the prevailing concept at present.

1. Context of the Evolution of the Pioneering University:

This section of the study attempts to briefly outline the historical context and the path of transformation towards the pioneering university since the emergence of the idea indirectly in the United States, in line with the nature of the American pragmatic society. The idea then spread to various European universities, which transformed into pioneering institutions aiming to support community development institutions. This diffusion occurred worldwide due to significant shifts in current economic dynamics. Thus, we can present this temporal context through three fundamental waves, as follows: (Mohammed, 2020, pp. 255-263)

1_1 First Wave: Universities in the United States:

The nature of the American society's perpetual pursuit of maximizing educational outcomes was the primary impetus for the emergence of the pioneering university. The concept of the pioneering university first appeared in the United States due to the alignment of the American university philosophy with its ability to provide services to society. It focused on vocational training and applied research since the 19th century, following the enactment of the Morrill Act in 1868, also known as the "Land Grant Act," which granted thousands of hectares of land to universities to foster community openness and achieve economic and regional development. This involved establishing colleges for agricultural, mechanical, and engineering education, where farmers and workers in all economic activities of the state were trained and educated, alongside conducting research in these specialties. Subsequently, the Naval Grant Act was issued, leading to the establishment of colleges to address maritime issues, followed by the aerospace

sector. Numerous laws were later enacted in other fields such as national security, biotechnology, and information technology.
It's noteworthy that the implementation of these laws was linked to academia's involvement with the industry in various forms and scientific tools. They played a significant role either in knowledge production or direct participation in business projects, leading to the emergence of important laws such as:
- Formulating unified policies for intellectual property rights,
- Establishing supportive infrastructure for innovation,
- Making several changes in the field of patent granting and licensing,
- Enacting the Cooperative Research and Development Law to prevent monopolies on research and development projects and previous research partnerships,
- Issuing the Federal Technology Transfer Act,
- Enacting the National Competitiveness Technology Transfer Act.

Subsequently, laws related to the openness of American universities to society and research partnerships between universities and industry were enacted under government auspices. Based on the foregoing, it becomes clear that the success of pioneering universities within the American society is linked to several principles, among the most important being the independence enjoyed by American universities, the support provided by the United States to universities through laws enabling their openness to society, as well as laws regarding intellectual property and partnerships between American universities and industrial institutions within society.

1_2 Second Wave: Universities in Western Europe:

Here, we delve into analyzing the reasons that led to the transition of the pioneering university model from American society to European society. We need this analysis to understand how communities attract successful university models aiming to make breakthroughs in society.

In the early 1990s, the mutual relationship between universities and industry through knowledge exchange became global. Many European countries introduced political reforms and initiatives to encourage and enhance the transfer of technology and knowledge at universities. Consequently, many European universities transformed from traditional research universities into pioneering universities with strong links to industry, encouraging entrepreneurial activities. The main reason for this transformation lies in the increasing importance of knowledge economy sectors, prompting European national governments and the European Commission to promote this type of education that supports research, knowledge transfer, entrepreneurial spirit, and departure from traditional education.

As a result, universities in the United Kingdom, Scandinavia, Belgium, the Netherlands, and other countries turned their universities into pioneering ones supporting entrepreneurs. However, during this transformation, European society faced many challenges, including:
- Different culture from the American culture and the absence of sufficient laws to achieve that;
- Lack of entrepreneurship culture among key stakeholders;

- Western European universities were state-owned and an integral part of government administration;
- Weak understanding among faculty members of their organizational roles when adopting models for various projects (lack of independence);
- Absence of policies and laws related to patents and licenses;
- Few connections with public research laboratories and small and large companies;
- Lack of a culture of organizing joint projects among all stakeholders;
- Inadequate clarification of reward systems for proposed projects.

This led to Western European universities entering a phase of hybrid practices, and project organization activities in universities were affected by these practices, with changes in university structures being among the most important, such as providing sufficient funding for these projects.

It is evident from the above that many European universities began to prepare the infrastructure for the pioneering university. Adopting a new approach requires many components, whether human, financial, or informational, to legislate for intellectual property, expedite the establishment of many scientific incubators and technological incubators. Without these components, hybrid practices, which appeared in many European societies, will emerge. Consequently, a complete model should not be adopted without qualification.

It is also worth mentioning that studies have failed to identify the location of pioneering universities in Europe in the mid-1990s, whether in France, Italy, Germany, etc. They were found only within relatively youthful organizations in semi-peripheral areas and former technical schools operating in the United Kingdom, Sweden, Finland, and the Netherlands.

Based on the above, it has been proven that it is difficult to simulate U.S. policies and implement its best practices in a European institutional context, as the gap between universities, industry, and government remains relatively large, as well as concerning intellectual property law, patent ownership, and others. However, despite all the weaknesses, the presence of some laws and practices indicates interest and focus on the pioneering university sector and ensures cooperation between universities and developmental institutions within the community, adapting to the society and environment in which they exist, and initiating partnerships between universities and developmental institutions in society.

The Third Wave: Brazil

The third wave is known for its impact on many developing countries, and we attempt to analyze this wave as follows:
Many universities in emerging countries that constituted the third wave began implementing entrepreneurial practices, such as Brazil, Korea, Russia, India, China, and South Africa, in the early 1990s. However, they faced clear differences in their economies, the general institutional formation of science and innovation systems, and the challenges they faced compared to those in the United States and Western Europe. The latter had their own national innovation systems, primarily focusing on scientific and technological activities aimed at invention,

technology transfer, and intellectual property rights protection. On the other hand, emerging economies like South Korea and Brazil had national learning systems, but for late-industrializing countries, technological change is essentially a learning process based on absorbing current technologies and reverse engineering to gain new technological knowledge.

In the same context, Brazilian society is among the developing societies vigorously seeking to transform its economies. Thus, Brazil struggled to establish such a national learning system and implement technology dissemination. The goal was to establish a scientific system based on research and its application to obtain technology ensuring self-sufficiency in the energy field and technological independence. This aimed to encourage the development of local innovations to meet local industry needs, considering the multinational corporations' ability to attract many investments within Brazilian society. Therefore, governments sought to provide a conducive environment for these investments through a model aimed at achieving this within universities, namely the entrepreneurial university model. Credit is attributed to Brazil's Intellectual Property legislation in 1996 and the Innovation Law of 2004, which is akin to the Bayh-Dole Act in the United States. This law provided several contributions, including:

- Introducing a model for developing collaboration between universities and industry.
- Regulating intellectual property for academic technologies.
- Providing incentives to enhance joint research between universities and companies.
- Developing business incubators and technology parks.
- Encouraging the academic sector to take the initiative in creating new support activities, such as providing technology services, training, joint research projects for companies, and sharing university equipment, laboratories, materials, and other facilities with small and startup companies to facilitate these types of initiatives and activities.
- Providing space for so-called mixed companies, startup companies (such as research projects between the public and private sectors still present within the university) or incubator facilities, and relying on the university for some financial institutions and administrative support.

Based on all the above, it is evident that universities have taken on some roles of industry and governance in utilizing knowledge and contributing to social and economic development. Thus, promoting technology transfer became one of the key elements of this mission, linking innovation with social and economic benefits, leading universities to adopt the concept of the entrepreneurial university.

Definition of the Entrepreneurial University:

In the rapidly changing world, there is a need for fruitful innovations, new information technologies, and professionals to use and develop them. In this context, universities have emerged as an integral part of the economic system, necessitating a reconsideration of their traditional role. The focus is no longer solely on teaching and graduating job seekers but has become imperative for universities to transform into hubs for innovative entrepreneurial ideas, making

them centers of industrial interest as sources of human capital and participants in creating value for corporate products, reducing their research and development costs. On the one hand, they serve as genuine incubators for graduating entrepreneurs with profitable projects.

For this reason, academic literature on entrepreneurship aims to ensure that the economic and social outcomes of the processes arising from these three active entities are most effective for everyone by studying collaboration between the public, industrial, and academic sectors. Hence, the concept of the entrepreneurial university emerged, which several researchers have tackled from various perspectives, some of which can be presented as follows:

Definition 1: The entrepreneurial university is one that distinguishes itself by its unique productive, human, and research outputs, whether directly through the interest of development institutions in its research outputs for application and transformation into advanced technology or by embracing the knowledge produced within university technology parks and incubators for application. It also indirectly increases the reputation of universities considered strategic intangible resources.
Definition 2: It is a practice aimed at transferring knowledge between the university and the external environment to produce economic and social value for both external parties and members within academic circles.
Definition 3: It is defined as universities that have the ability to participate in economic development by engaging in new project creation or research marketing. Therefore, they are universities based on seizing available opportunities, creating new ones, identifying them, taking risks, and responding to challenges.

From all the above, it can be said that the entrepreneurial university is one that has not only satisfied its primary mission and traditional role in research and education but has evolved its vision and expanded its role to include creating business pioneers capable of creating jobs instead of seeking them. Also, it provides diverse funding sources to transform the resulting knowledge into technological applications that can be marketed to the external community. In addition to providing a rich base of innovations, technologies, and transferable scientific research valued by the industrial sector, which now views the university as a strategic partner under a comprehensive development vision. Thus, the entrepreneurial university is required to perform three tasks simultaneously: teaching, research, and entrepreneurship on both the internal and external levels.

The Importance of Entrepreneurial University:

Entrepreneurial universities play a significant role in bringing about a strategic breakthrough for universities, whether at the internal or external level. The importance of entrepreneurial universities can be outlined in several points as follows:

- Entrepreneurial universities contribute to advancing the research system, especially in its applied aspects. They focus on achieving their goals through teaching, scientific research, and community service to make a tangible impact on local and regional development. This is due to the significant influence resulting from their cognitive and human outputs.

- They achieve economic breakthroughs through entrepreneurial activities that increase the gross domestic product by investing in new projects that utilize the outputs of scientific research and knowledge produced by universities, transforming them into new technologies that contribute to creating new products or services for individuals and institutions.
- Generating innovative added value from the knowledge it produces and turning it into economic and social development for society.
- Embracing technology-based organizations.
- Building relationships with the government and industry to enhance creativity-based learning and encourage it.
- Identifying entrepreneurial behavior patterns that challenge bureaucracy and encourage innovation.
- Stimulating and encouraging innovation within the organization by selecting and implementing new opportunities, exploiting and acquiring resources to provide new services.
- Enhancing the university's capacity for risk-taking and seizing opportunities and innovation.
- Having a very positive impact on economic and social stability.
- Entrepreneurship is essential as a growth strategy and competitive advantage.
- Entrepreneurship represents an opportunity for the university to increase income and contribute to society through the services it provides.

Based on the above, the entrepreneurial university can be considered an open space based on creativity and flexibility, which enhances the emergence of entrepreneurial ideas, especially those based on technology, facilitating their transfer alongside experiences and knowledge from the university to the external environment, thus enhancing the university's outputs in achieving development at both the partial and overall levels.

Objectives of the Entrepreneurial University:

There are several objectives that the entrepreneurial university seeks to achieve. Let's try to identify some of these objectives as follows:

- Economic development based on knowledge, where entrepreneurial thinking in universities contributes to achieving economic and social goals.
- Removing barriers between the known Triple Helix model embodied in universities, government, and industry. This goal aligns with the call for sustainable development strategies.
- Diversifying university funding sources, as many universities suffer from a severe shortage of funding sources. Therefore, returns from patents, licensing agreements, and collaboration with industry are important sources of university funding.
- Marketing university outputs, whether research, human, or technological outputs, requires contracting with many marketing companies to market these outputs or having a marketing sector within these universities.
- Transforming traditional teaching, research, and service processes in universities into creative processes based on projects and various challenges facing universities, in order to develop solutions and also to benefit from all resources.

- Creating value through teaching, scientific research, and community service by providing innovative activities that help attract talents, address research topics that help seize opportunities available in the market, and foster organizational adaptability.
- Creating a competitive advantage in attracting talented faculty and students, enhancing creative thinking about how the university meets multiple missions, supporting infrastructure to increase its technological capabilities, and preparing its staff to keep pace with technological developments and develop its institutional work.
- Helping university graduates to obtain innovative job opportunities and expand employment opportunities through entrepreneurial education.
- Training future entrepreneurs who will start their own projects, managing student activities in entrepreneurial ways, identifying their latent entrepreneurial capabilities, raising awareness of their entrepreneurial role towards themselves, their university, and their community, and equipping them with skills to manage financial resources, develop evaluation-related capacities, penetrate the market, and respond quickly to local, regional, and international entrepreneurial initiatives and initiatives.
- Developing entrepreneurial qualities, behaviors, and skills for faculty members and employees through direct interaction with industry.
- Monitoring closely what is happening in the environment and easily responding to these changes, while contributing to solving environmental problems.
- Developing global partnerships with the industrial sector to market students and applied research, formalizing technology, and creating new services.

Based on the above, it can be said that adopting the entrepreneurial model by the university as an approach to achieving its mission, its openness to external relations, especially with business sectors, and its contribution to achieving economic and social development, necessitates a reconsideration of its strategy and thus defining its objectives stemming from its entrepreneurial direction.

- Justifications for the Shift towards Entrepreneurial University:

Adopting the philosophy and model of the entrepreneurial university has become a goal pursued by many universities at various levels. This is due to several reasons, the most important of which are outlined as follows (Mohammed, 2020, p. 274):

1. The pursuit of disseminating scientific research conducted within departments to stakeholders. The dissemination of research from academic departments to the external community is the cornerstone of the philosophy upon which the entrepreneurial university is based. This is because retaining knowledge within scientific libraries can lead to its depreciation. Therefore, there is a need to initiate a shift in knowledge management to achieve this.
2. Enhancing patents to increase the creation of knowledge that aids in generating new technologies with commercial potential.
3. Attempting by researchers or department employees to explore new (non-traditional) methods to achieve their goals. Academic departments have the right to identify new opportunities outside the traditional academic environment, focusing on non-traditional methods in research funding, problem-solving, and relationships with external organizations.

4. Collaboration between faculty members and the university with the business system.
5. Attempting to eliminate centralized policies and facilitate creativity in administrative work, adopting flexible policies capable of attracting and marketing creative ventures appropriately.
6. Working according to a sustainable development strategy. This strategy, with its economic, social, and environmental dimensions, focuses on increasing competitiveness and relying on knowledge.
7. Breaking the isolation between universities and their developmental environment, as entrepreneurial universities rely on a degree of cooperation between universities and developmental institutions in society.
8. Overcoming the inadequacy of financial resources allocated to universities, which do not match the requirements of competitiveness. Entrepreneurial universities work to provide various funding sources for universities.
9. Transitioning from internal dissemination of scientific research conducted at universities within libraries to external dissemination, where entrepreneurial universities direct scientific research to external stakeholders.

Secondly: Practical Aspect

1. Requirements for Achieving the Entrepreneurial University:
Based on the foregoing, adopting the entrepreneurial university model requires the provision of supportive infrastructure for the transition towards this orientation, whether administrative, financial, cultural, or even intellectual. Some refer to these as transition pathways. Researchers' viewpoints have been varied and intertwined regarding the requirements and pillars of the fundamental entrepreneurial university. Therefore, through this part of the study, we will attempt to enumerate each researcher's perspective using the following table:

Table No. (01): Requirements of the Entrepreneurial University

Researcher	Year	Requirements
Clarek	**1998 2004**	Five key pathways serve as a summary for five case studies of European universities on their way to transforming into entrepreneurial universities as follows: - Enhanced governance structure (effective management) - Expanded developmental environment - Diverse funding base - Academic heartening incentives - Integrated entrepreneurial culture
Etzkowitz	2004	Five dimensions are presented as fundamental proposals for moving towards the entrepreneurial university as follows: • Knowledge capitalization (focus on intellectual capital) • Integration with industry and government sectors • Independence from any specific domain within the framework of integration • Hybridization or balance in managing the tension between independence and mutual reliance • Responsiveness (rapid response) and continuous

Researcher	Year	Requirements
		renewal of internal structures
Gibb al	**2009**	They have compiled a list of the most important requirements necessary to change the traditional university model and considered them as characteristics, as follows: - Developing an entrepreneurial mindset - Building entrepreneurial communities - Establishing a teaching context based on entrepreneurial skills - Developing competitive strategies for challenges - University internationalization strategies - Knowledge capitalization through knowledge production, global organization, exchange, and sharing - University funding - Entrepreneurship - Independence and self-governance - Academic freedom - Focus on value creation.
Arnout	**2010**	Focus on establishing pathways toward becoming an entrepreneurial university to enhance its capability in project organization, considering it as fundamental characteristics. These pathways include: • Creating a conducive environment to encourage entrepreneurial thinking and behavior. • Emphasizing a culture of innovation within the university campus for all students. • Offering diverse specializations across various colleges and academic departments. • Involving external stakeholders in designing and implementing entrepreneurial activities. • Having strong institutional leadership support. • Implementing a system of rewards and incentives for both students and faculty members. • Adopting a broad approach to entrepreneurship to facilitate business startups. • Providing education focused on entrepreneurship.
Thorp Goldstein	**2010**	They focused placed on drawing a comprehensive vision for the various components of the entrepreneurial university through analyzing different models of both American and non-American universities, as follows: - Emphasizing seizing entrepreneurial opportunities. - Aligning academic disciplines with entrepreneurship. - Establishing projects across interdisciplinary fields. - Promoting social entrepreneurship. - Supporting environmental specializations. - Cultivating entrepreneurial leadership. - Providing education and training in entrepreneurship. - Cultural change towards entrepreneurship. - Accountability.

Researcher	Year	Requirements
Rich al	**2010**	Based on in-depth studies of six leading universities in ecological systems and entrepreneurship frameworks in America, Europe, and Asia, seven key factors have been identified as follows: • Support from university senior leadership. • Faculty members who are entrepreneurial. • Long-term commitment to supporting entrepreneurship. • Allocation of significant support for financial resources. • Innovation in curricula and programs. • Appropriate organizational infrastructure. • Providing sustainability for entrepreneurial projects through building supportive organizational networks that involve all relevant stakeholders in the community.
The European Commission for Education and Culture in cooperation with the Organization for Economic Cooperation and Development (EC-OECD).	**2012**	They presented a guiding framework consisting of 7 areas targeted by European universities aiming towards becoming entrepreneurial universities, as follows: - Leadership and governance. - Organizational capacity, individuals, and incentives. - Developing entrepreneurship in teaching, learning, and education. - Flexible pathways for entrepreneurs. - University-business/external relations for knowledge exchange. - Entrepreneurial university orientation as an international institution. - Measuring the returns of the entrepreneurial university.

Source: Compiled by the researchers based on a study (Halmi & Abdulrahman, 2022, pp. 115-11).

Analyzing the content presented in the table above, despite the differing and varied components or pathways listed by each researcher, they intersect and share several points while differing in others. This is due to the differences in the researchers' perspectives on entrepreneurial universities in their studies, as well as the geographical boundaries of the universities studied. Based on the intersections and points of convergence of each researcher's contributions, these components can be summarized into the following elements:

- Support from university senior leadership and the transition towards entrepreneurial leadership rather than university presidency.
- Establishing a teaching context based on entrepreneurial skills (education focusing on entrepreneurship).
- Involvement of external stakeholders in designing and implementing entrepreneurial activities.
- Creating an extensive environment to encourage cultural change and entrepreneurial attitudes and behaviors.
- Diverse specializations operating across various faculties and academic departments.
- Allocation of significant support for financial resources and appropriate organizational structure.

- Knowledge mapping (a focus on intellectual capital).
- Collaboration with industry and government sectors.
- Continuous renewal of internal structures.
- Adopting a broad approach to entrepreneurship that allows for business startups and aligns academic disciplines with entrepreneurship.
- Faculty members who are entrepreneurial.
- Independence and self-governance.

2- Entrepreneurial University Activities:

In this aspect of the study, we will try to shed light on the most important activities and practices adopted by entrepreneurial universities, which give them a character of entrepreneurship and distinguish them from other traditional university patterns, through the multiplicity of their three functions embodied in teaching, scientific research, and community service. These activities will be discussed in a manner that helps us understand their contribution to the economic progress of the community in which they operate on one hand, and their ability to contribute to the financial advantages provided to universities on the other hand. The following table provides a detailed breakdown of the aforementioned:

Table No. (02): Entrepreneurial University Activities

No.	Forms of Entrepreneurship	Description	Contribution to Economic Progress	Contribution to Financial Benefits
01	Establishing a Technology Park	Providing an official site for the university's technology park, where tech-savvy companies can locate near and interact with the university.	Lays foundational structures for developing multiple new projects that contribute to regional employment growth. Attracts highly skilled individuals and technological resources, enhancing the university's research capacity.	Generates a small income for the university in its role as "owner"; however, the main financial contribution is indirect, with partnerships enabling research opportunities, education, licensing, and technology transfer.
02	Spin-off Companies	Establishing companies based on university research.	Creates new entrepreneurial ventures within an economy where technology moves from labs to market, leveraging	University holds shares, generating revenue flow from trading and sales.

No.	Forms of Entrepreneurship	Description	Contribution to Economic Progress	Contribution to Financial Benefits
			intellectual property and generating jobs.	
03	Patents and Licensing	Securing intellectual property rights on discoveries and understanding how to cultivate and develop them within the university.	Knowledge contributions within the university allow controlled transfer of intellectual property to suitable industry partners who can use it to gain a competitive advantage and generate wealth.	Revenue flow generated directly through licensing and royalties. Securing intellectual property rights forms the foundation for spin-offs and serves as a "shop window" for research outputs, attracting industry attention.
04	Research Contracts	Conducting specific research projects with industry partners, many of which have a strong commercial focus.	Supports industry by solving practical problems that enhance business performance. Contract research involvement also strengthens social ties between university and industry, potentially leading to deeper future research collaboration.	Revenue stream from industry co-funded research. Indirect financial support related to contracts (e.g., equipment, human resources, IP, and materials from industry) can also strengthen university research capabilities.
05	Training Programs for Industry	Teaching industry students, including executive education and HR training	Enhances the national/regional workforce skill level concerning current practices and emerging technologies,	Revenue from industry or government for conducting training, with indirect benefits from industry

No.	Forms of Entrepreneurship	Description	Contribution to Economic Progress	Contribution to Financial Benefits
		programs within industry sectors.	ensuring regional industry remains competitive by expanding its internal skills base.	links, which may lead to entrepreneurial activities in the future.
06	Consulting Services	Directly selling university expertise to external organizations to solve scientific problems.	Provides personal advice and guidance to improve organizational performance. It may also build university-industry ties that could be leveraged in the future.	Revenue flows from industry or government for consulting. Indirect benefits from industrial links could lead to future entrepreneurial activities.
07	Grants and Funding	Obtaining large-scale research grants from external sources for conducting basic research.	Enhances the university's reputation, attracting industry to the area and possibly leading to the development of more sophisticated forms of academic entrepreneurship.	Financial benefit from external research funding and direct contribution to other entrepreneurial activities (e.g., a funded research project could lead to a patent, forming the basis for a licensing agreement).
08	Publishing Academic Results	Publishing books, chapters, and articles.	Enhances the university’s reputation, attracting industry to the region and potentially leading to advanced forms of academic entrepreneurship.	Indirect financial benefit, as publishing helps demonstrate the university's ability to attract industry sectors and underscores the university's global standing.

No.	Forms of Entrepreneurship	Description	Contribution to Economic Progress	Contribution to Financial Benefits
09	Producing Highly Qualified Graduates	Providing skilled workforce from undergraduate and graduate students.	Produces appropriately skilled graduates for the regional and national workforce, meeting both current and future industry needs. Ensures national industry capacity by integrating the university within a triple-helix model.	New, relevant programs attract students, generating tuition revenue. Indirect benefit from networking contacts as graduates enter industry and maintain connections with the university.

Source: (Mohamed, 2020, p. 271)

From the table above, it is evident to us the differences and non-traditional additions that have been incorporated into the tasks of the traditional university to become entrepreneurial-oriented, adding value to many parties. This starts with university students and the formation of human outputs with special specifications capable of penetrating the developmental institutions in society, through faculty members and the university as a whole, especially in terms of demonstrating the university's high competitive capabilities, contributing to diversifying funding sources, and ultimately to the economy and development.

3- What is the difference between a traditional university and an entrepreneurial university?

After understanding the concept of the entrepreneurial university, its characteristics, and the requirements for adopting it as an approach based on entrepreneurial concepts, as well as presenting the most important activities that highlight the significant differences between it and the traditional university model, several differences between the two models emerged, which can be presented as follows:

Table No. (03): Differences between the Traditional University and the Entrepreneurial University

Criterion	Traditional Universities	Entrepreneurial Universities
Openness to Society	Isolated from society	Open to and actively engaged with the external community
Location of Teaching	Teaching occurs solely on campus	Teaching occurs both on and off campus
Purpose of Knowledge Creation	Knowledge is created mainly for academic promotion or obtaining	Knowledge is created to fulfill various objectives

Criterion	Traditional Universities	Entrepreneurial Universities
	degrees	
Focus of Research	Emphasis primarily on basic research	Emphasis on applied research, utilizing all available inputs
Knowledge Utilization	Very limited utilization of knowledge	Effective utilization of generated knowledge
Technology Transfer	No technology transfer; no associated support institutions	Technology transfer offices (TTOs), incubators, and tech parks are present
Departmental Focus	Departments based on specific knowledge branches	Departments focused equally on environmental and multidisciplinary studies
Stakeholder Location	Stakeholders concentrated internally	Stakeholders distributed internally and externally
Management Sources	Managed exclusively by academic staff	Management includes diverse sources, such as industry and government
Funding Sources	Reliant on a single primary funding source	Funding based on revenue generated from outputs, enabling reciprocal funding
University Philosophy	Philosophy centers on self-sustainability	Philosophy emphasizes substantial regional development contribution
University Governance	Purely academic management approach	Entrepreneurial mindset, fostering initiative and innovation

Source: Compiled by the researchers based on a study (Mohamed, 2020, p. 273).

From the table above, we can conclude several key differences between traditional universities that are isolated from their environment, considering the university only for scientific research and obtaining points and grades, and entrepreneurial universities that are open to the external community with an entrepreneurial mindset capable of leading and benefiting from the community in funding universities with the gains they offer. Additionally, their research policies are capable of producing knowledge that leads the community through management that adopts this approach.

Conclusion

In the midst of a highly competitive and dynamic environment, the need for knowledge in all fields has become an urgent necessity that cannot be overlooked. This need is translated into innovative technologies, practical solutions, and creative ideas that add value in one way or another. The primary source of this knowledge is universities, which have recently realized that their roles have evolved from being mere spaces for exchanging and sharing theoretical knowledge stored on papers and in cloud storage without benefiting from it, to becoming hubs that bring together major research and development centers relied upon by industrial institutions to gain a sustainable competitive advantage. This necessitates universities to open up to their external environment and focus on

their human resources as a real asset that enables them to support and achieve sustainable competitive advantages by providing a conducive climate and supportive infrastructure for transforming traditional universities into entrepreneurial universities that practice entrepreneurial behaviors in all their activities, by every member within the university community framework of the knowledge economy and the growing global trend towards entrepreneurship to meet the requirements of the knowledge economy based on excellence, entrepreneurship, competitiveness, proactivity, and risk-taking.

Results

This theoretical study, which addressed the theoretical grounding of the entrepreneurial university, led to several conclusions, some of which are listed below:

- The entrepreneurial university is one that operates under the motto of scientific research, development, and economic growth.
- The first appearance of the concept of the entrepreneurial university was in the United States, followed by its spread across Europe and other countries.
- The relationship between the university and its external environment is based on interaction and mutual exchange between it and industry and government through the transfer and transformation of technology, research, and qualified personnel to add value to all parties. This is currently known as the Triple Hilex model.
- The entrepreneurial university is an opportunity to enhance the scientific research system in the applied aspect and to invest in its outputs by transforming them into new technologies that contribute to creating new products and services for industry and society.
- The climate of the entrepreneurial university encourages the creation of entrepreneurial students and entrepreneurial professors with a mindset more open to the economic and social reality.
- Diversification of funding sources and valorization of scientific research and marketing of patents are among the most significant results stemming from the adoption of the entrepreneurial university, as it makes the university a wealth-producing institution and an efficient economic engine.
- Filling research from academic departments to the external community is the primary and main pillar of the philosophy of the entrepreneurial university, which refuses to lose the importance of knowledge by storing it instead of sharing and valorizing it, and making it the innovative pillar of solutions to the problems faced by economic and social institutions.
- Adopting the entrepreneurial university model requires support from senior leadership primarily, the provision of necessary infrastructure, internal structural changes, allocation of significant financial support, and diversification of specializations operating across various faculties and departments.
- One of the features of the entrepreneurial university is reliance on entrepreneurial education and building a teaching context based on entrepreneurial skills.
- Independence and collaboration with the industry and government sectors are a necessity for universities seeking to adopt the entrepreneurial university model in order to capitalize on knowledge and thereby create prosperity for the country.

Recommendations:

Based on the findings obtained in the study, the following recommendations are proposed:

1. It is essential to redefine the university's strategy and its executive plans to align them with the requirements of the entrepreneurial university.
2. Foster an entrepreneurial culture within the university community as a form of preparation before fully adopting the approach to avoid resistance to change that may hinder the transition towards the entrepreneurial university.
3. Increase awareness of the importance of transitioning towards the entrepreneurial university and the prospects it offers for all stakeholders.
4. Enhance partnership and collaboration initiatives and strengthen strategic alliances between the university and economic institutions within the framework of mutual cooperation.
5. Prepare and provide the necessary material requirements and infrastructure for the entrepreneurial university, including technological devices, spaces, etc
6. Improve the internal communication system between university units and departments and external communication between the university and its economic environment to facilitate communication and work within a highly entrepreneurial framework.
7. Conduct training courses and workshops in entrepreneurial skills development for academic and administrative leadership within the university.
8. Intensify awareness campaigns and promote the entrepreneurial culture among students, especially those approaching graduation.
9. Transitioning towards the entrepreneurial university is a significant leap that requires a well-structured, calculated, and studied strategy.
10. Review the curriculum and academic programs of the university to align them with the goal of graduating individuals capable of creating job opportunities and striving for self-employment.
11. Work towards achieving financial, academic, and administrative independence.
12. Remove philosophical and educational barriers that hinder collaborative research across different disciplines to enhance creativity.

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