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**Requirements for Activating Scientific Research Strategies in Arab Universities
and Their Impact on Human Development**

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Abstract

There is no doubt that global development requires the cooperation of the public sector, private sector and universities, but the latter bears the main responsibility because it is the most important and most effective tool in the development process it must weigh on the development of state agencies and the private sector, and education in general, and direct the activity of these devices, to the correct destination, so this study has the purpose of clarifying the suffering of research scientist in Arab universities and hinders the achievement of human development, we have divided it into three axes, in the first axis, we talked about the crisis of scientific research in Arab universities, while the second axis we have clarified the obstacles to the effectiveness of scientific research in human development in the Arab world, and the third axis we left it to clarify the development of scientific research of Arab universities to meet the requirements of human development, In conclusion we present the proposed results and recommendations.

Keywords : Research Scientist, Development, Education.

الملخص:

لا شك أن التنمية الشاملة تتطلب تعاون القطاع العام والقطاع الخاص والجامعات، ولكن المسؤولية الأساسية تتحملها هذه الأخيرة لأنها هي الأداة الأهم والأكثر فاعلية في العملية التنموية، فعليها يقع عبء تطوير أجهزة الدولة والقطاع الخاص، والتعليم بشكل عام، وتوجيه نشاط هذه الأجهزة الوجهة الصحيحة، إذن هذه الدراسة تهدف لتوضيح ما يعانيه البحث العلمي في الجامعات العربية ويعيق تحقيق التنمية البشرية، لذا فقد قسّمناها لثلاث محاور، في **المحور الأول** تحدّثنا عن أزمة البحث العلمي بالجامعات العربية، أما **المحور الثاني** فوضّحنا فيه معوقات فعالية البحث العلمي في التنمية البشرية بالعالم العربي، أما **المحور الثالث** فقد تركناه وقفًا لتوضيح متطلبات تطوير البحث العلمي بالجامعات العربية تحقيقًا للتنمية البشرية، وختمنا دراستنا هذه بخاتمة تضمّنت النتائج و التوصيات.

الكلمات المفتاحية: البحث العلمي، التنمية، التعليم

Introduction:

The university relies on three types of activities, which complement each other, to achieve its objectives: preparing societal leaders, conducting academic research, and serving its social and economic environment. Higher education aims to graduate leaders capable of influencing the political, social, and intellectual climate in order to accomplish the development process.

The role of the university is also evident in establishing a genuine partnership with both private and public sector institutions. These institutions collaborate with the university in formulating interim objectives for curricula, determining the types of scientific research needed, and practically utilizing its results. Naturally, these institutions will employ university graduates and benefit from professors as consultants. To strengthen and expand the base of this partnership, universities frequently hold conferences, seminars, and roundtables, involving state leaders and private sector representatives to define objectives, develop plans, and evaluate various political, social, and economic activities.

When the private sector realizes that the university contributes to increasing its economic productivity and profits, it becomes enthusiastic about supporting the university financially, funding its research, conferences, and other projects. According to some studies, the world spends approximately 2.1% of its total national income on scientific research, which amounts to about \$536 billion. Additionally, around 3.4 million researchers work in scientific research institutions worldwide, averaging 1.3 researchers per thousand members of the workforce.

The estimated expenditure of the United States, Japan, and the European Union on research and development is approximately \$417 billion, which accounts for more than three-quarters of the total global spending on scientific research. The United States alone spends more than \$168 billion annually on research, representing about 32% of the total global expenditure. Japan follows with \$130 billion, equivalent to over 24% of the world's total research spending. Next in line among developed countries are Germany, France, Britain, Italy, and Canada, bringing the total expenditure of these seven nations to over \$420 billion. These countries are home to approximately 2.265 million researchers, representing more than 66% of the total global research workforce, with each researcher costing around \$185,000 per year.

Amidst all these figures, the shortcomings of scientific research in Arab countries are not limited to financial resources and infrastructure but extend to human capital itself. These countries are now facing a severe shortage of researchers, despite once being pioneers in producing intellectuals whose names were etched in the world's leading universities. Today, however, they struggle to replenish their research workforce, as most researchers have shown reluctance to engage in active research, content with their academic titles and roles within

universities and laboratories. Given this reality, it is imperative to create and develop human resources in this field through the adoption of a national research strategy.

What, then, is the core issue of scientific research in the Arab world? What are the obstacles hindering its progress? And what are the necessary requirements for its development?

To address these issues, we have adopted a descriptive analytical approach by examining and analyzing texts and documents related to the research topic. Additionally, we have employed a historical approach by reviewing various experiences in this field.

To answer the research questions, we have structured our study into three main sections:

First Section: The crisis of scientific research in Arab universities.

Second Section: Obstacles to the effectiveness of scientific research in human development in the Arab world.

Third Section: Requirements for the development of scientific research in Arab universities.

First Section: The Crisis of Scientific Research in Arab Universities

There is a near-consensus on the existence of a crisis in scientific research within universities, with its manifestations varying, its causes being diverse, and the proposed solutions differing based on the social positions, intellectual orientations, and political affiliations of those involved. While university scholars may generally agree on describing the symptoms of this crisis, they differ in defining its nature, identifying its root causes, and determining the appropriate ways to overcome it—whether on a long-term strategic level or a short-term operational one.

The crisis of scientific research in universities is the outcome of official policies and practices toward universities as scientific and technological institutions and as intellectual leaders of society over the past forty years. Some may prefer a selective approach in highlighting certain negative aspects of scientific research while ignoring others or attributing these issues solely to internal mechanisms within the university itself. Others attempt to isolate what happens within universities from broader societal dynamics, separating university challenges, roles, concerns, and aspirations from the overarching political,

economic, and social changes within the Arab world. Such an approach risks leading to further confusion and misdirection¹.

A university can only fulfill its scientific, technological, and intellectual roles within the framework of comprehensive planning that defines societal needs for higher education and scientific research in addressing community problems and finding solutions. However, there is no well-founded scientific study that accurately outlines the specific needs of Arab countries for various academic disciplines. This gap results from the absence of a genuine national plan for human development that could serve as a solid foundation for work in this field. When shifting the focus to the internal dimensions of the crisis, several indicators emerge, which can be summarized into four main points:

First: The Scientific and Intellectual Climate Within Universities

There is no doubt that universities play a crucial role in developing and advancing society by actively contributing to the education and training of qualified professionals and producing skilled graduates who can engage in scientific work and serve the community.

Since university professors are the cornerstone of the educational and instructional process, providing a conducive academic environment with adequate material and scientific resources, academic freedoms², independent administration, and intellectual transformation is essential for them to fulfill their duties effectively³.

Scientific research requires the proper exercise of academic freedom and the ability⁴ to express dissent, even against representatives of political authority. Additionally, the attitudes of the ruling political elite toward science—whether they regard it as a supreme value in itself or as an effective tool for addressing societal challenges—will determine the extent of attention given to scientific institutions, the degree of focus on training scholars, and the level of financial support allocated to research.

One of the most critical challenges facing the educational system within universities is that these institutions have not become significant entities in the scientific field. They remain fragmented, suffer from marginalization, lack incentives and resources, and are often burdened with numerous non-scientific responsibilities (such as teaching and administrative tasks). Consequently, there is a constant aspiration among academics to migrate—either to the Arab Gulf or the West—where they can find the essential resources to showcase their creativity. Meanwhile, research centers are in a state of stagnation, suffering from an inadequate research environment, an aging researcher demographic, and an inability to attract young scholars equipped with modern technology and the necessary enthusiasm to drive progress⁵.

Second: The Status of University Professors as Researchers

The situation of university professors engaged in research worsens year after year, primarily due to the absence of an independent and encouraging budget for scientific research. Moreover, obtaining a research grant involves lengthy and complex procedures, compounded by a limited number of funding institutions. Most universities in developing countries prioritize teaching over scientific research for various reasons, whereas developed countries allocate massive budgets for research, recognizing that the returns far exceed the expenditures.

In contrast, spending on scientific research in Arab countries remains minimal due to funding shortages, with a significant portion of allocated budgets consumed by salaries and wages⁶. This lack of investment stems from a general disregard for research and an underestimation of its developmental value for individuals and society. For instance, only 1% of the gross national income is allocated to research in Arab countries, compared to 3.1% in Israel (equivalent to \$540 per capita)⁷.

Scientific research activities conducted within Arab universities and research centers rank among the weakest in the world, primarily due to the limited number of researchers and specialists, the scarcity of well-structured research teams, and the fact that many faculty members engage in additional work outside academia. Furthermore, a considerable portion of university budgets is absorbed by administrative expenses rather than research funding⁸.

Given these circumstances, it is understandable that brain drain has become a widespread phenomenon in the Arab world. While some academics voluntarily seek advanced specializations unavailable in their home countries, others leave due to political instability, security concerns, economic hardships, or a combination of these factors. Although some scholars return after obtaining their doctorates, many soon find themselves departing again, disheartened by the lack of research institutions, inadequate working conditions, and the absence of material and scientific incentives that foster innovation. This migration is not a coincidence but rather the outcome of difficult realities and the pursuit of a better future⁹.

Third: The Quality of Scientific Research

Peer-reviewed academic publishing serves as a key indicator of scientific research output, while patent registrations and trademarks provide tangible evidence of research productivity¹⁰.

Scientific research conducted within universities—whether by faculty scholars or graduate students—contributes to the cumulative knowledge base and

strengthens the university's role in advancing society. It plays a vital part in fostering progress, prosperity, and the ability to adapt to contemporary challenges across various fields¹¹.

Unfortunately, most scientific and technological advancement indicators—particularly in scientific production and publication—have remained stagnant in Arab countries over the past decade. It is distressing to note that only a very limited number of patents have been registered by Arab innovators, and there have been very few new products or production methods introduced in Arab nations. Additionally, spending on research and development has seen only a slight increase¹².

The rapid advancements in information technology have had a profound impact on higher education systems in developed countries. However, the utilization of these advancements in the Arab higher education sector remains limited and marginal. Information and communication technology (ICT) tools—such as computers, networks, and various creative tools essential for building computer-based education systems—are not widely integrated. Moreover, there is a lack of systematic and continuous training programs that would equip faculty members with the skills necessary to effectively use these tools in designing modern curricula¹³.

In the 2010 Times Higher Education World University Rankings, only one Arab university, the University of Alexandria, made it to the top 200, ranking 149th. University rankings are largely based on the number of research papers published in internationally indexed journals within databases such as Scopus (Elsevier). Among 2,124 universities and independent research centers worldwide that published more than 100 research articles between 1996 and 2008, only 23 universities from Arab countries appeared on the list—accounting for merely 1% of the total.

These included 11 universities in Egypt, 4 in Saudi Arabia, 2 in Jordan, 2 in the United Arab Emirates, and 1 each in Kuwait, Lebanon, Oman, and Sudan. Notably absent from this list were countries with historically prestigious universities and significant human and financial research capabilities, such as Iraq, Syria, Tunisia, Algeria, and Morocco.

Additionally, among the top 2,124 research institutions worldwide, only two non-university scientific research centers from the Arab world were represented. The average ranking of Arab universities in this classification stood at 1,413, with the median rank being 1,344—placing them in the bottom 63% of institutions globally.

In stark contrast, Israel had 7 universities ranked among the top 806 institutions worldwide, with a median rank of 302 and an average ranking of 363, placing them within the top 15% of global institutions. Additionally, 9 non-university

research centers in Israel ranked with an average position of 981, meaning that Israel alone had 16 universities or research institutions among the world's top 1,000. In comparison, the entire Arab world had only 5 or 6 institutions ranked within this category¹⁴.

Fourth: The Decline in the Content, Methods, and Technologies of Higher Education

The quality of higher education content, its methods, and its technologies are among the most important variables that determine the extent to which higher education aligns with and adapts to social, cultural, and technological changes at national, regional, and international levels.

The current state of Arab education indicates imbalances and weaknesses in this indicator, as this system has remained confined to traditional mindsets and programs that have led to a stark disparity between institutional discourse, as imposed in curricula and academic syllabi, and the reality that students and graduates experience in their daily lives. Additionally, it has been trapped by a malignant ideology that continues to reproduce backwardness, its structures, and its forces¹⁵.

Higher education curricula have failed to absorb or capitalize on the advancements brought about by technological, scientific, and informational revolutions to renew and develop themselves. This, in turn, has led to major dysfunctions, which have had a significant negative impact on the competence of graduates and their suitability for the demands of the new reality.

Second Axis: Obstacles to the Effectiveness of Scientific Research in Human Development in the Arab World

Researchers across the Arab world have dedicated their efforts—through symposiums, articles, and studies to discussing the obstacles that hinder the effectiveness of scientific research in human development within Arab universities. Their opinions and studies collectively identify numerous obstacles, the majority of which exceed the universities' ability to address them alone.

Before delving into these obstacles, it is useful to briefly highlight the impact of scientific research in higher education on human development. This will help us understand the significance of scientific research, especially in recent years, given the information revolution.

First: The Impact of Scientific Research in Higher Education on Human Development¹⁶

There is no doubt that scientific research in Arab countries plays a significant role in developing human resources, given that universities possess trained and qualified human capital, academic staff, and technical experts capable of driving change and pushing forward the development process. Additionally, scientific research helps preserve the cultural and civilizational heritage of the Arab people.

In today's world, education cannot exist in isolation from society, its needs, and its problems. Therefore, scientific research aims to achieve the following objectives¹⁷:

- **A.** Increasing human knowledge by establishing solid foundations for scientific research within universities.
- **B.** Developing the capabilities of postgraduate students in research methodologies and techniques across various disciplines.
- **C.** Preparing highly specialized professionals to meet the requirements of comprehensive development plans and societal needs.
- **D.** Studying problems with local and Arab dimensions in particular, as well as broader issues in general.

Therefore, achieving the desired human development is dependent on providing beneficial and effective education that contributes to the holistic development of individuals. Such education equips them with work and production skills, enhances their abilities, refines their talents and potential, and prepares them for innovation, renewal, creativity, and excellence¹⁸.

Second - Objective Obstacles to the Effectiveness of Scientific Research in Human Development:

A - Lack of a Clear Scientific Policy in Various Arab Countries to Define Goals and Priorities Based on Available Resources:

Most Arab countries lack clear policies for scientific research that include defining objectives, priorities, necessary research centers, and providing essential financial resources. Practical experiences across Arab countries have demonstrated that spending on scientific research is subject to the perspectives of different ministries. A research plan may be set in a particular ministry, but once the ministry changes, the plan becomes obsolete. This reflects the absence of strategic plans across all aspects of life¹⁹, a major disaster afflicting scientific research. The dependence of research and development on individuals rather than on strategic policies and plans, as is the case in the West, is one of the worst obstacles, as it can reset scientific research to square one with every administrative change²⁰.

B - The Gap Between Development Plan Designers, Implementers, and Researchers in Universities and Scientific Centers:

This gap is due to a lack of cooperation between academics and practitioners, in addition to the absence of a shared language of understanding between the two sides. It is rare for ministries, institutions, or companies to fund applied research or to consider and adopt its findings and recommendations²¹. This has led researchers to refrain from engaging in solving human development problems.

C - Weak Funding Allocated to Scientific Research in Arab Countries:

The total expenditure on scientific research in these countries does not exceed 0.5% of the gross national product (GNP), while some developed countries allocate 6% of their GNP to scientific research. In 2002, the Arab Labor Organization issued a report titled *"Scientific Research Between Arabs and the Zionist Entity and the Migration of Arab Competencies."* The report revealed the stark scientific and technological disparity between Arabs and Israel, demonstrating Israel's overwhelming superiority in these fields. It showed that Arab spending on scientific research does not exceed 0.002% (two per thousand) of the national income annually, whereas in Israel, it reaches 8.1%.

Additionally, the per capita spending on education in Arab countries does not exceed \$340 per year, compared to \$2,500 per year in Israel. In the Human Development Index—which measures income, education, and health—Israel ranks 23rd worldwide, while Egypt ranks 199th, Syria 111th, Jordan 92nd, and Lebanon 82nd, despite being geographically adjacent to Israel.

Regarding computer usage, Israel has 217 computers per 1,000 people, compared to only 9 per 1,000 in Egypt, 52 per 1,000 in Jordan, and 39 per 1,000 in Lebanon²².

Third - Obstacles Related to Researchers:

1 - Brain Drain:

The issue of Arab brain drain represents a severe loss for the Arab intellect. Statistics indicate that 54% of Arab students studying abroad do not return to their home countries. Additionally, 34% of skilled doctors in the United Kingdom are of Arab origin. Egypt alone has contributed approximately **60%** of Arab scientists and engineers in the United States in recent years. Iraq, on the other hand, has witnessed the migration of about 7,300 scientists who left their country due to political and security conditions. In total, since 1977, more than 750,000 Arab scientists have emigrated to the United States²³.

2 - Weak Usage of the Arabic Language:

According to the principle that every nation flourishes through its language, one of the major civilizational challenges facing the Arab world is how to adapt Arabic for scientific research and maximize its usage. Monitoring the current state

of the Arabic language on the Internet provides crucial insights worth discussion and reflection. Recent statistics reveal that Arabic content on the Internet is alarmingly low, comprising only one per thousand (0.1%) of the total web pages available. This can be attributed to several factors:

A - Lack of Confidence in Researchers and University Research Institutions:

The fundamental issue here is the extent to which the Arabic language is used in laboratories, research incubators, and the scientific output of researchers and scholars in Arab universities. This dilemma is linked to the previously mentioned reason—the weak conviction in the efficiency of the Arabic language for scientific expression. Additionally, the lack of trust in research institutions within Arab universities has had a negative impact on the quality of scientific production by researchers in these institutions²⁴.

B - Absence of Arabic Scientific Terminology and the Scarcity of Arabic Scientific References:

Despite the existence of the **Arabization Coordination Office** in **Rabat, Morocco**, which works on unifying Arabic scientific terminology across the Arab world, it has failed to establish, implement, and enforce the widespread use of standardized Arabic scientific terms in research and advanced academic studies²⁵.

C - The Lack of a Scientific Research Environment Leads to the Alienation of Arab Researchers:

Undoubtedly, the two previously mentioned reasons are enough to make the academic research environment in the Arab world unattractive and unmotivating. As a result, many researchers have chosen to migrate in search of "**scientific environments**" that prioritize research and place it among their core values and strategic priorities. This ensures the dominance of scientific thinking, fostering productivity, innovation, and creativity²⁶. Conducting research and producing innovative work in Arabic—using Arabic linguistic tools, concepts, and terminology—has a profound impact on strengthening the status of the language, both among its native speakers and internationally. The prestige of a language reflects the prestige of its people.

Third Axis: Requirements for Advancing Scientific Research in Arab Universities to Achieve Human Development

Based on the previously discussed points, it is crucial to reassess the current conditions of scientific research and eliminate the obstacles and deficiencies that hinder its ability to fulfill its objectives and meet expectations. We will outline

several key requirements that provide a forward-looking vision for an improved and more effective approach to scientific research in Arab universities—one that enhances its quality, purpose, and practical impact.

First: Requirements for Establishing a Scientific Research Environment

1. Creating a Clear System to Link Universities with Society and State Institutions

This system should establish joint programs aimed at conducting studies, finding solutions to technical and developmental issues, or advancing technological research and development. It should define mechanisms for cooperation between university researchers (faculty and graduate students) and industrial projects, companies, institutions, and community organizations²⁷.

2. Achieving Full Integration Between University Education Policies and National Development Plans This includes economic, social, and cultural plans, as well as developing university curricula to ensure the graduation of qualified professionals who can meet the needs of society and contribute effectively to development projects²⁸.
3. Encouraging Cooperation Between Arab Universities and Overcoming Nationalist Divisions this includes fostering joint Arab scientific collaboration, encouraging faculty exchange programs, developing modern research planning strategies, and facilitating joint supervision of master's theses and doctoral dissertations. Additionally, professors should have unrestricted access to attend scientific seminars and conferences across the Arab world without bureaucratic obstacles²⁹.
4. Enhancing Research Information Databases universities should offer expanded research database services to support academic libraries and create a broad academic information base that benefits both faculty members and graduate students³⁰.
5. Providing Incentives for University Professors (Both Financial and Moral) Professors should be encouraged to engage deeply with society's economic, social, and technological transformations, directing their research toward solving national problems and contributing to sustainable development³¹.

Second: Organizational, Legislative, and Financial Requirements

1. Increasing Investment in Scientific Research Governments should allocate more funds for serious research projects and provide adequate financial support to faculty members for conducting research. Additionally, an annual reward system for outstanding research should be established. This can be achieved by creating joint funding initiatives to support and sustain scientific research³².

2. Creating Effective Communication Frameworks with Arab Researchers Abroad Given the brain drain phenomenon, it is crucial to establish attractive³³ communication channels with Arab researchers abroad. Modern information and communication technologies offer cost-effective ways to maintain regular contact with expatriate scholars. Further incentives should include facilitating their visits and temporary stays, as well as developing comprehensive databases to track and connect with skilled Arab professionals overseas³⁴.
3. Implementing Democratic Principles in University Leadership Selection University leadership positions, from university presidents to department heads, should be selected through democratic elections rather than political appointments³⁵.

Universities should be granted financial and academic independence, ensuring freedom of research and expression to allow them to fulfill their crucial role in societal progress and development.

4. Establishing a Centralized Scientific Research Committee

A central research committee should be formed, consisting of deans of scientific research from all universities or their representatives.

This committee's primary role would be to develop a unified research policy through a comprehensive plan that:

- Sets priorities and guidelines for scientific research.
- Aligns research objectives with societal needs and developmental requirements.
- Ensures efficient utilization of available university resources and expertise.

Conclusion:

Scientific research is the foundation of progress and civilization. While past conflicts between nations were largely political or military, today, scientific research has become the primary battleground for competition. It is now the key benchmark of a nation's superiority. Recognizing that a nation's strength lies in the intellectual and scientific capabilities of its people, most countries devote significant attention to advancing research.

Given that the Arab world is not lacking in resources, intellectual talent, universities, or research centers, the core issue is how to effectively utilize these

assets. Time is not in our favor, and urgent efforts are needed to establish well-structured programs that can ignite a comprehensive scientific and intellectual renaissance, laying the groundwork for an Arab knowledge-based society.

Findings:

- Lack of an encouraging environment for scientific research in the Arab world.
- Absence of mechanisms to effectively utilize research outcomes from Arab universities for development.
- Brain drain has widened the gap between advanced industrial nations with cutting-edge technology and Arab countries, which remain in a rudimentary state. As mentioned earlier, these scientific and technical experts are the foundation of progress, responsible for planning and executing development.
- Arab countries have lost approximately \$200 billion due to the migration of their intellectual talents abroad.

Recommendations:

- Establish clear Arab scientific strategies with the participation of researchers from across the region.
- Create virtual research centers at the Arab world level.
- Strengthen the role of non-governmental scientific institutions and associations.
- Encourage investment in science and technology within the Arab world.
- Reform higher education curricula to align with societal needs in light of ongoing transformations.

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