

The Importance Of Investing In Human Capital To Drive Scientific Research In Algeria

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ABSTRACT

This research paper aims to shed light on the extent of the contribution of investment in human capital to the development of scientific research in Algeria by studying its most important indicators, based on the results achieved and leading to the most appropriate proposals to activate it appropriately in order to ensure the quality of higher education institutions, on the one hand, and to achieve the advancement of societies on the other hand. All this through the establishment of an investment culture of human capital at the level of the Algerian university.

The study reached several results, the most important of which are the low spendings on research and development from the gross domestic product and the absence of researchers in private non-profit institutions. Also, Algeria is ranked 91st globally, according to the Human Development Index, which is lagging behind.

Keywords: Human capital; investment in human capital; scientific research; indicators of scientific research.

Introduction

Scientific research is a fundamental element for the advancement and development of societies. Therefore, most countries have focused on developing and supporting it, considering it's the backbone that contributes to achieving development in various dimensions. This interest is reflected in several indicators, the most important of which, among others, are the percentage of spending on scientific research, the number of patents, the number of researchers, and scientific publications.

Scientific research is one of the primary functions of universities, being a vital factor in their evaluation based on their scientific and knowledge levels. The success of a university is largely bound to the publication of its scientific research, necessitating the need to focus on fostering its practice to produce knowledge and encourage creativity. This is achieved through investment in human capital, which has become the foundation of long-term development. It is important to note that the benefits of this investment require a long time to take place, which sometimes leads to a reduction or cessation of investment due to the delayed visibility of its impacts and benefits on society.

Conversely, Arab countries, including Algeria, face significant challenges in this field. Despite the declared will to improve scientific research, performance indicators remain weak and do not meet the desired aspirations.

Problem Statement:

Based on the above, we can put forward the central question of our research paper:

To what extent does investment in human capital contribute to the development of scientific research in Algeria?

To answer the main question of the study, the following sub-questions were proposed:

- What are the indicators of investment in human capital?
- What is the current state of scientific research in Algeria?

Importance of the Study:

The importance of this study lies in shedding light on the current state of scientific research in Algeria and highlighting the key indicators for its evaluation in higher education institutions. This importance arises from the prominent position that scientific research holds as a fundamental element in the advancement and progress of societies.

Objectives of the Study:

The objectives of this research are to control the study variables, solve related issues, and present results that benefit economic decision-makers in Algeria by:

- Focusing on the importance of investing in the development of human skills and capabilities.
- Reviewing and analyzing the current state of scientific research in Algeria.

Methodology of the Study:

To answer the research problem of this paper, a descriptive methodology was adopted to comprehensively understand the theoretical framework of the study variables, and an analytical methodology to analyze them and examine their development over the study years.

Content of the Study:

Our research study includes several sections, highlighted as follows:

- **Conceptual Framework for Investment in Human Capital:** This section presents concepts that build the theoretical reality of investment in human capital, covering its importance, dimensions, and influencing factors.

- **Introduction to Scientific Research:** This part of the work introduces scientific research, outlining its objectives and various classifications.

- **Indicators for Evaluating Investment in Human Capital:** This section addresses the indicators and measures used to evaluate the effectiveness of investment in human capital, such as education level, training, and the number of researchers.

- **The Current State of Scientific Research in Algeria:** This section assesses the state of scientific research in Algeria, including the research network, the level of funding allocated, and the number of registered patents.

1. Conceptual Framework for Investment in Human Capital:

Human resources are among the most important assets an organization possesses. Therefore, organizations must invest in these resources due to their significant role in managing various activities and functions.

1.1. The Concept of Human Capital:

Human capital is defined as "the value an individual brings to an organization through a diverse set of capabilities, skills, and experiences, contributing to the achievement of the organization's goals." (Qdeed, p. 250)

Human capital also refers to "the knowledge, skills, behaviors, and experiences that individuals possess and generate." (Chamak, 2006, p. 19)

Therefore, human capital can be summarized as "the total competencies, knowledge, and experiences that individuals have when performing their tasks."

1.2. Importance of Human Capital:

The importance of human capital can be summarized in the following points: (Abbas & Bouteldja, 2020, p. 429)

- Human competencies are the foundation of scientific research and work.
- Human capital contributes to creating new sources of national income, beyond natural resource revenues.
- Preparing qualified human competencies is essential for achieving economic and social development.
- Human capital is the basis for creativity and innovation, allowing individuals to develop new ideas and visions.

1.3. Definition of Investment in Human Capital:

Investment in human capital can be defined as "the process of spending time, money, and effort to develop human competencies to encourage them to increase their productivity." (Azizi & Ben Souilah, 2021, p. 244)

It can also be defined as "training the worker to improve their knowledge level and productive skills, thereby increasing future income." (Bisar, 2017, p. 178)

The importance of investing in human capital can be summarized as follows: (Al-Mosabbah , p. 06)

- The human resource is considered one of the most important resources of the institution, which drives and contributes to achieving development. Therefore, it is necessary to educate and train this resource to reach the desired goal, as education contributes to the accumulation of human capital. Various economic growth theories indicate that educated human resources increase the pace of technological advancement, which in turn increases the long-term economic growth rate.
- The impact of education on productivity can be realized through the social return on investment in education. Education also indirectly affects productivity by influencing health levels, as demonstrated by many studies. Therefore, it can be said that education develops human resources by enhancing efficiency, increasing capacity, and boosting the productivity of various economic sectors.
- The quality of education and its relevance to societal needs also play a role in achieving development. Additionally, teaching modern production skills to those with a good basic education is easier and less costly than training the uneducated. As we live in the age of knowledge, it requires workers to have high and continually updated skills, within successful organizations that make good use of them.
- Development experiences across the globe indicate that increasing sustainable growth rates is achieved by enhancing productive capacity and investing in both tangible and intangible economic resources. This forms the core of achieving the goals of increasing productivity and long-term employment levels.

1.4. Dimensions of Investment in Human Capital:

Investment in human capital has various dimensions, including: (RAIS, 2021, pp. 93-94)

- **Cultural Dimension:** The increasing percentage of educated individuals within the human resources reflects on the civilizational development of society. An individual's attachment to their homeland, religious beliefs, cultural heritage, language, and literature helps in raising their awareness and understanding of their surroundings.

-**Economic Dimension:** Economic development programs are implemented through well-trained human resources, achieving progress for the state and providing the needs of its citizens for various products. Additionally, a well-trained individual has a better chance of working as a productive citizen, contributing added value that stimulates the economic cycle.

-**Social Dimension:** Education enriches an individual's mental and intellectual energies, imparting balanced behavioral patterns and values. This makes the individual more understanding of social difficulties and problems, more capable of strengthening family ties, and has a tangible impact on one's self-awareness.

-**Scientific Dimension:** Education plays a crucial role in developing competencies capable of research, creativity, invention, and development, contributing to various civilizational shifts and achieving technological advancements in all fields of life.

-**Security Dimension:** Emphasizing the importance of educating individuals can reduce unemployment rates, thereby achieving societal security stability, in addition to individuals' conviction of the necessity of maintaining this stability.

1.5. Factors Influencing Investment in Human Capital:

The factors influencing investment in human capital include: (Hassan, 2013)

- **Geographical Factors:** These include the country's location, natural environment, resource sources, and climate. The climate determines the appropriate age to start education and the beginning and end of academic terms. The availability of natural resources in a country allows it to generate revenue that provides additional financial capacity, which can be utilized in spending on human capital development.

-**Demographic Factors:** Investment in human capital is sensitive to population compositions and growth rates. The age distribution of the population across educational stages determines the required quantity of educational facilities and resources. An increase in population growth rate necessitates an expansion of facilities. If the state is unable to meet this demand, it will lead to higher illiteracy rates, overcrowded classrooms, and increased pressure on universities. This, in turn, leads to a focus on the quantitative aspect of education at the expense of quality, resulting in wasted human resources, unutilized potential, and a mismatch between educational outputs and labor market needs, exacerbating unemployment.

-**Social Factors:** Social factors affecting investment in human capital include:

- Work, exposure to risks, and fairness;
- Individual well-being;
- Perception of society;
- Human security..

2. Introduction to Scientific Research:

We will address a series of key points that will enrich this aspect of our research paper, as follows:

2.1. Definition of Scientific Research:

Scientific research is defined as "the means by which individuals acquire knowledge and direct research through the methodologies or theories used. It aims to discover scientific truths, removing ambiguity surrounding the phenomena." (Farwana & Al-Deeb, 2022, p. 267)

Scientific research is "a systematic process based on an organized framework to explore facts and analyze phenomena to interpret them." (Al-Majidel & Shamma, 2010, p. 28)

Thus, scientific research is an organized and systematic process aimed at investigating a phenomenon, problem, or question to discover new knowledge or interpret existing knowledge.

2.2. Objectives of Scientific Research:

The main objectives of scientific research include: (Fawzia, 2009, p. 288)

- Improving the state of society in economic, social, and cultural aspects by developing policies and programs that contribute to sustainable development;

- Enhancing the scientific and cultural progress of the university, and developing its civilizational mission, which works to enrich society as a whole;

- Scientific research aims to integrate scientific work between the university and other institutions at both national and global levels, by promoting scientific cooperation and interaction.

- Presenting the university as a source of expertise, consultations, and scientific research outputs for local development projects, contributing to sustainable development in the region.

These objectives reflect the comprehensive guidelines for scientific research, aiming to achieve a positive impact on society and make valuable contributions in the fields of science and cultural development.

2.3. Classification of Scientific Research:

-Scientific research can be classified into three types: (François, 2006, p. 42)

Basic Research: Involves theoretical work primarily aimed at acquiring knowledge related to observed phenomena and events, without the intention of applying or using it;

-Applied Research: Involves work undertaken to find new solutions that allow for achieving a specific goal, and this research requires consideration of existing knowledge;

-Development: Refers to the processes and investments that enable progress and improvement in a particular field, focusing on production methods. Development can include improving processes and techniques used in production, adopting new technologies, or enhancing current methods to achieve greater efficiency. Development requires investments in Research and Development (R&D), skill development for the workforce, and the adoption of modern technologies.

In this context, the development of companies and institutions allows for the improvement of their performance and innovation in their operations, leading to progress and increased productivity and efficiency.

3. Indicators for Evaluating Investment in Human Capital:

The indicators for evaluating investment in human capital include:

3.1. Human Development Index:

Human development indicators are important determinants used to assess the progress of societies in the fields of health, education, and income. In this context, we present information related to the ranking of some Arab countries according to the Human Development Index within the data of the following table:

Table 1: Human Development Report.

Country	Arab Ranking	Global Ranking	Value
United Arab Emirates	01	26	0.911
Bahrain	02	35	0.875
Saudi Arabia	03	35	0.875
Qatar	04	42	0.855
Kuwait	05	50	0.831
Oman	06	54	0.816
Algeria	07	91	0.745
Tunisia	08	97	0.731
Egypt	09	97	0.731
Libya	10	104	0.718
Palestine	11	106	0.715

Source: (Prepared by the researchers based on the Human Development, 2023/2024, pp. pp. 26-27)

The results of the Human Development Report 2023/2024 issued by the United Nations Development Program and illustrated in Table 01 show a significant variation in human development levels among Arab countries. Starting with the Gulf countries, which topped the list of Arab countries, the United Arab Emirates ranked first among Arab countries and 26th globally, reflecting a very high level of human development, including significant improvements in health, education, and income indicators. Both Kuwait and Bahrain ranked 35th globally, indicating a similarly high level of human development. Qatar ranked 42nd globally, maintaining its status among countries with high human development. Kuwait came in at 50th globally, reflecting a good position in terms of human development. Oman ranked 54th globally, placing it among countries with high human development but slightly lower than its Gulf neighbors. It can be said that Gulf countries enjoy high levels of human development due to substantial investments in education, health, infrastructure, and economic and political stability.

As for the Maghreb countries, Algeria ranked first in the Maghreb, seventh among Arab countries, and 91st globally with a score of 0.745, placing it in the category of medium human development. This result reflects significant progress compared to neighboring countries. Tunisia and Egypt both ranked 97th globally, indicating a comparable level of human development and a need for further improvements in education, health, and economic sectors. Libya ranked 104th globally, falling into the medium human development category but lagging behind other Maghreb and Arab countries. Palestine ranked 106th globally, reflecting significant challenges to human development amid difficult political and economic conditions.

This analysis highlights the disparity in human development in the Arab region and underscores the areas needing improvements and sustained efforts to achieve comprehensive development. Countries with medium human development need to focus on enhancing educational and health infrastructure and improving economic conditions to achieve higher levels of human development.

3.2. Education Expenditure:

Expenditure on education reflects the extent of a state's commitment to developing its educational system and improving the quality of education available to its citizens. Education is a fundamental pillar for building a strong and prosperous society, so investing in it constitutes a significant part of the budget for countries seeking to improve their human development levels.

The following table illustrates the evolutionary trend of education expenditure in Algeria from 2016 to 2023, based on its percentage of total government spending:

Table 2: Education Expenditure.

Year	2016	2017	2018	2019	2020	2021	2022	2023
Expenditure Percentage %	16.10	17.60	13.80	14.50	16.50	16.20	13.10	13.30

Source: (World Bank, 2024)

It is noticeable that the percentage of education expenditure in Algeria fluctuates from year to year. It was 16.10% of government spending in 2016, rising to 17.60% in 2017 due to the renewed increase in oil prices, which allowed the government to increase education spending and implement government initiatives to improve educational infrastructure and new programs aimed at enhancing the education system. This was the highest percentage compared to other years. However, in 2018, education expenditure fell to 13.80%, a significant drop due to the decline in oil prices again, which led the government to reallocate financial resources to address the large budget deficit that year. In 2019, the percentage slightly increased to 14.50%, reflecting the government's efforts to address funding shortfalls and improve some aspects of the education system after the significant drop in the previous year, especially after oil prices stabilized, enabling the government to balance different sectors.

In 2020, the percentage of expenditure rose again to 16.50%, accounting for the extraordinary expenses incurred by the government to combat the COVID-19 pandemic. However, in 2021, the percentage slightly decreased to 16.20%, reflecting the government's rearrangement of priorities without significant changes in spending.

The significant drop in 2022 to 13.10% could be attributed to the ongoing impact of the COVID-19 pandemic on the Algerian economy, prompting the government to reduce education spending in favor of more urgent sectors such as health and essential services. In 2023, the percentage saw a slight increase to 13.30%, reflecting the beginning of economic recovery and the government's attempts to gradually improve educational conditions after the significant reductions in previous years.

3.3. Number of Researchers:

This indicator reflects the extent of human resources utilization in research and development fields, considering researchers are the primary source of new ideas with the dual task of producing and exploiting knowledge.

Table 3: Number of Researchers in Algeria.

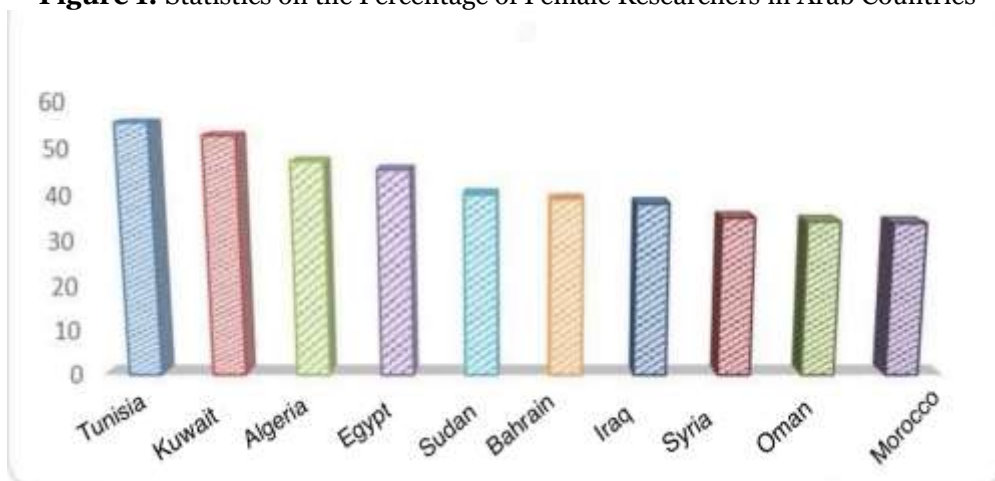
Algeria	2018
Number of Researchers	819.10

Source: (ALECSO Observatory, 2024)

From the table, it is observed that the number of researchers in Algeria reached 819.10 per million inhabitants, ranking fifth among Arab countries after the UAE, Tunisia, Saudi Arabia, and Morocco. (ALECSO, 2022), reflecting Algeria's efforts to enhance research and development despite the economic and financial challenges it faces.

It is worth noting that the number of female researchers has seen a significant increase over the past decades, now constituting 30% of the total number of researchers globally. This indicates gradual but uneven improvement across different countries. In Arab countries, for example, female researchers still face multiple challenges, including social and cultural constraints, unequal opportunities, and lack of research funding. Nonetheless, ongoing efforts to promote women's participation in scientific research through government policies, educational initiatives, and developing policies that support women's participation in scientific research and other initiatives have enabled women to enter the field of scientific research and compete with men. The following figure shows statistics on the percentage of female researchers among the total researchers in some Arab countries.

Figure 1: Statistics on the Percentage of Female Researchers in Arab Countries



Source: Prepared by the researchers based on (ALECSO Observatory, 2024)

From the previous figure, it is clear that Algeria ranks third after Tunisia and Kuwait, with about 40% female researchers. This indicates a high percentage of female researchers in higher education and research institutions compared to some other Arab countries. It can be said that Algeria is making tangible efforts to enhance the role of women in scientific research, reflecting the government's commitment to supporting higher education for women. The lowest percentage was recorded in Morocco, after Oman and Syria, with less than 20% female researchers, highlighting the need for more efforts to support women's participation in scientific research.

The variation in the percentages of female researchers can be attributed to differences in policies, resources, and cultural environments in each country. The following table will clarify the distribution of researchers across different sectors:

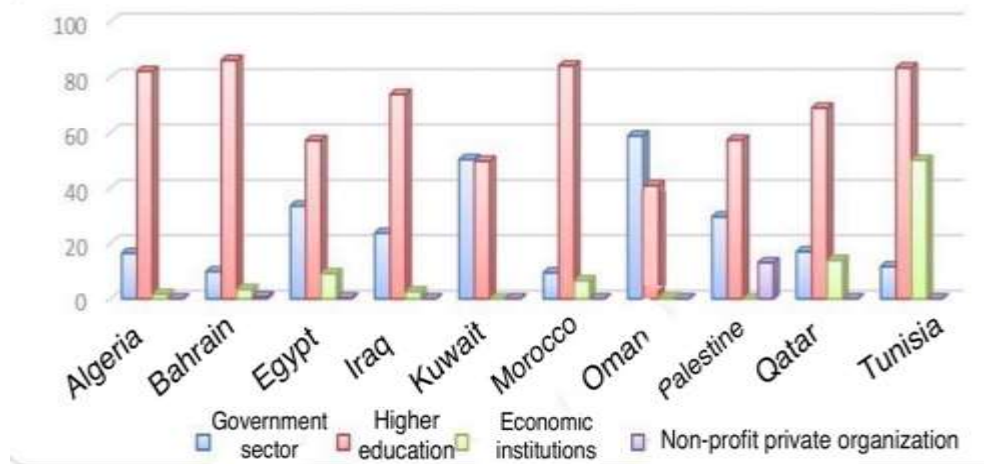
Table 4: Distribution of Researchers by Sector.

Country	Year	Government Sector	Higher Education	Economic Institutions	Non-Profit Private Institutions
Algeria	2017	16.40	82.1	1.6	-
Bahrain	2014	9.80	86.1	3.4	0.7
Egypt	2018	33.50	57.1	9.1	3.0
Iraq	2018	23.70	73.8	2.5	-
Kuwait	2018	50.30	49.7	-	-
Morocco	2016	9.40	84.1	6.5	-
Oman	2018	58.80	40.9	0.3	-
Palestine	2013	29.60	57.3	-	0.13
Qatar	2018	17.20	68.9	13.9	-
Tunisia	2018	11.60	83.4	5.0	-

Source: (ALECSO Observatory, 2024)

It is noticeable from the table above that the majority of researchers in Algeria are in the higher education sector, with a percentage exceeding 82%, as Algeria focuses on scientific research within institutes and universities. The percentage of researchers in the government sector is 16.40%, which is relatively low compared to other countries like Kuwait and Oman, where the percentages are 50.30% and 58.80% respectively. The lowest percentage is found in economic institutions, at 1.6%, which is very low compared to Egypt (9.1%) and Qatar (13.9%), reflecting the limited contribution of the economic and government sectors to scientific research. As for non-profit private institutions, there are no researchers in this field in Algeria. Generally, non-profit institutions play a very limited role in scientific research in most Arab countries compared to other sectors.

Figure 2: Relative Distribution of Researchers by Sector.



Source: Prepared by the researchers based on the data in the previous table.

Most researchers in Arab countries are concentrated in the higher education sector, while the number of researchers in economic institutions is relatively low, with their percentage not exceeding 10% in most Arab countries except Qatar (13.9%). It is also noted that there is an absence of researchers in non-profit private institutions in most Arab countries, except for three countries: Bahrain, Egypt, and Palestine, where the percentage of researchers is very low, as reflected in the percentages: 0.7%, 0.3%, and 13% respectively.

4. The State of Scientific Research in Algeria:

We can continue discussing scientific research in Algeria by focusing on different stations and various aspects, as follows:

4.1. Research Network:

From Table 5, it is clear that the scientific research network in Algeria is under the supervision of the Ministry of Higher Education and Scientific Research, which includes six agencies, 19 research centers, 12 research units, and 1,472 research laboratories. This confirms what was previously mentioned about the concentration of most researchers in universities rather than in economic institutions and others.

Table 5: Scientific Research Entities.

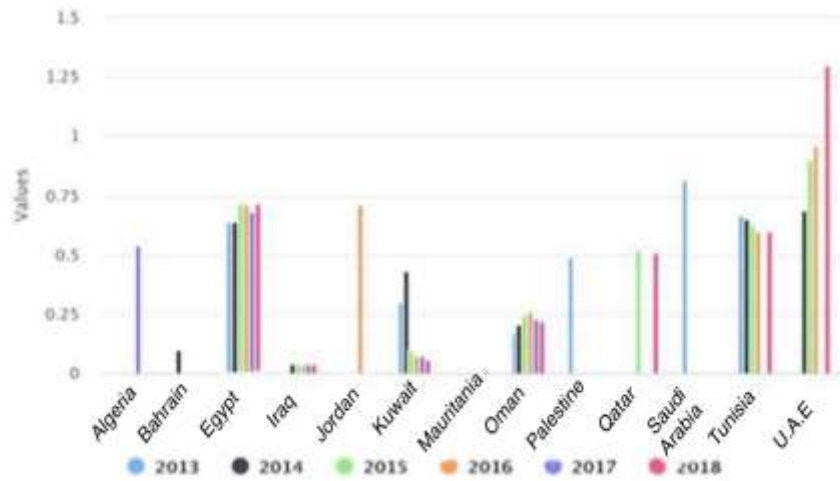
Number	Research Entities
06	Agencies
19	Research Centers
12	Research Units
1472	Research Laboratories

Source: (Ministry of Higher Education and Scientific Research, 2022)

4.2. Funding for Scientific Research:

Funding aimed at establishing the foundations of scientific research is a vital indicator for assessing the level of State' interest and its efforts in developing sciences and research. Scientific research funding is a vital element for achieving progress and growth in various fields. Funding provides the necessary resources to develop new ideas and transform them into innovative products and services, contributing to enhancing the national economy. The following figure will address the evolution of expenditure on research and development from the gross domestic product (GDP) in some Arab countries:

Figure 3: Evolution of Expenditure on Research and Development from GDP in Some Arab Countries.



Source: (ALECSO Observatory, 2024)

From the figure above, it is clear that the percentage of expenditure on research and development in Algeria reached 0.54% of GDP in 2017, while the rates were 0.23% in 2001, 0.37% in 2002, 0.2% in 2003, and 0.16% in 2004. It then dropped to 0.07% in 2005 (World Bank, 2024), which are very low percentages compared to the Arab average of 0.61% and the global average, which exceeded 1.72% in 2017.

Based on the above, it can be said that Algeria suffers from a lack of funding for scientific research for various reasons, which may include other economic priorities, economic challenges such as declining oil prices, bureaucracy, lack of private sector investments, brain drain, or weak infrastructure. Therefore, the government must adopt strategies that enable good funding for scientific research as it is considered a long-term investment that contributes to improving individual lives, developing society, and promoting sustainable development.

4.3. Patents:

To determine the state of the evolution of patents and their applicants in Algeria over recent years, the following table provides the relevant data:

Table 6: Total Patent Applications by Algerian Researchers.

Institutions of Higher Education and Scientific Research	Number of Patent Applications		
	2018	2020	2021
Institutions of Higher Education and Scientific Research	134	158	232
Research Centers of the Ministry of Higher Education and Scientific Research	107	135	150
Research Agencies of the Ministry of Higher Education and Scientific Research	07	07	07
Total Patent Applications	389	300	248

Source: (Directorate General for Scientific Research and Technological Development, 2024)

There is an increase in the number of patent applications in institutions of higher education and scientific research during the years 2018, 2020, and 2021, with a total of 134, 158, and 232 patent applications respectively. Research centers have also seen an increase in patent applications, with a total of 107 applications in 2018, 135 in 2020, and 150 in 2021, indicating an improvement in research and innovation activities in these institutions. However, the research agencies of the Ministry of Higher Education and Scientific Research did not see an increase in patent applications, recording only seven applications over the same period, indicating a need for more support or restructuring to increase their research activity.

4.4. Scientific Publications:

Scientific publication is measured by the number of publications and scientific releases, in terms of the number of published research papers and relative specialization indicators, which measure the publication rate in various fields of knowledge, indicators of partnership between researchers from several countries on one topic, as well as the productivity indicator in publishing research.

The Arab scientific output published in the ISI Web of Science database during the period 2008-2018 amounted to approximately 410,549 papers, distributed across 22 Arab countries, as shown in the following table:

Table 7: Number of Research Papers Published in Arab Countries, in Relation to the Total Arab Scientific Output Published.

Rank	Country	Number of Research Papers	Percentage
01	Saudi Arabia	112,565	25%
02	Egypt	106,891	24%
03	Tunisia	48,417	11%
04	Algeria	37,137	8%
05	Morocco	26,914	6%
06	UAE	25,360	6%
07	Jordan	16,890	4%
08	Qatar	16,328	4%
09	Lebanon	15,087	3%
10	Iraq	12,119	3%
11	Kuwait	9,294	2%
12	Oman	7,793	2%
13	Sudan	4,379	1%
14	Palestine	3,786	1%
15	Syria	3,251	1%
16	Libya	2,902	1%
17	Yemen	2,235	0%
18	Bahrain	2,224	0%
19	Mauritania	300	0%
20	Djibouti	118	0%
21	Somalia	74	0%
22	Comoros	68	0%
	Total	410,549	100%

Source: (Arab Scientific Community Organization, 2020)

It is evident from the table above that Algeria ranks fourth with 37,137 papers, accounting for 8%, following Saudi Arabia, which ranks first with 112,565 papers at 25%, Egypt in second place with 24%, and Tunisia in third with 48,417 papers at 11%. Algeria shows significant progress in research output, which can be attributed to the increased focus on scientific research in recent years, alongside efforts by universities and research centers to improve academic performance. Morocco and the UAE rank fifth and sixth with 26,914 and 25,360 papers, respectively. The Comoros is at the bottom of the list, ranking 22nd with 68 research papers.

Conclusion:

Investing in human capital is the key to achieving scientific progress in Algeria. By enhancing local competencies and providing a suitable environment for research and innovation, Algeria can make significant advancements in various scientific and technological fields, positively impacting the overall development of the country.

Applying some scientific research indicators to Algeria shows the considerable lag it faces compared to developed countries, as reflected in the statistics and results presented in this study. Algerian universities still face many problems, which generally act as obstacles to encouraging scientific research, thus hindering the achievement of the desired performance.

Therefore, it is necessary to establish the importance of a research culture in universities to develop the ability to produce science and knowledge by adopting the process of investing in human capital. A successful university is one that forms individuals capable of adapting to new developments and working as a team, requiring these teams to possess the knowledge and ability to research and innovate.

Study Results:

This study attempted to focus on the importance of investing in human capital to develop scientific research in Algeria. The main findings of the study are:

- Low level of expenditure on research and development as a percentage of the country's GDP;
- Absence of researchers in non-profit private institutions;
- Algeria's ranking of 91st globally in the Human Development Index, a very low rank;
- A low number of published research papers in Algeria.

Study Recommendations:

To achieve the goals of the scientific research policy in Algeria, the following points should be emphasized:

- Making the process of investing in human capital a long-term investment, requiring appropriate mechanisms for its formation;

- Directing scientific research to serve development in its various dimensions, given the role it plays in societal development;
- Giving research laboratories their true role and directing them towards achieving the desired goals;
- Creating national centers of excellence for scientific research;
- Establishing a national research network and linking it with Arab and international laboratories to keep up with developments in scientific research;
- Unifying scientific and research efforts in higher education institutions and other organizations;
- Providing necessary funding for scientific research development;
- Directing and supporting serious researchers and granting them encouraging incentives to ensure the continuity of their contribution to the development of scientific research;
- Encouraging scientific publication and unifying efforts to issue high-quality and specialized scientific journals;
- Building a comprehensive database of scientific research, researchers, and postgraduate theses and making it accessible to all;
- Providing the necessary mechanisms to nurture and support students who have the ability to innovate and excel.
- Enhancing coordination between various ministries, the private sector, and non-governmental organizations to expand the support base for scientific research and increase the diversity of funding and supervisory sources, which can contribute to promoting innovation and development in different fields;
- Organizing training programs and workshops to develop researchers' skills and increase their creative abilities;
- Establishing business incubators and innovation centers to encourage researchers to turn their ideas into practical projects;
- Improving infrastructure by creating and updating laboratories and research facilities to ensure a suitable environment for researchers.

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