

Scientific Research in Algeria Between Reality and Prospective

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Abstract:

This study aims to Offer an image of the truth of research in Algerian University, supported by many criteria, as well as the sources of funding for scientific research in Algeria and, therefore the structures of scientific research, also because the analysis of business fields and establishments in Algeria, and eventually he mentioned the mechanisms of developing scientific research in Algeria. This study has reached a group of results; the foremost necessary of that are: the requirement to extend the state's support and the participation of the personal sector in funding scientific research in Algeria, also because the improvement of research structures and Algerian scientific journals and therefore their inclusion in international databases, and the promotion of the values of creative thinking and innovation among researchers, which ends up within the preparation of research Live up to the amount of publication in international journals.

Keywords: Scientific research, Algerian university, Structures of scientific research, Obstacles, Mechanisms.

INTRODUCTION

Scientific research is one of the most prominent distinctive developments of our current era, as many nations have realized that their existence, entity, and development are linked to what they achieve in the field of scientific research, so they began to draw plans, evaluate centers and institutions, and monitor extensive financial credits, realizing that investment in scientific research is one of the most critical types of investment and the formation and promotion of higher education institutions, in addition to its mission to provide tires with skills and knowledge. Universities have played this role in all countries that have made progress in scientific research due to their need for research results in various fields.

Scientific research has gained significant importance in developing countries due to Because of its great importance in the development and advancement. On the other hand, there are many circumstances and factors that can be considered responsible for the decline and delay of scientific

research in Arab universities, including the Algerian University, and perhaps one of the reasons for this delay is the lack of a clear policy for scientific research, the weak psychological motivation of researchers, and the lack of budget allocated for research. Scientific research negatively affected the quality of scientific research.

2. The problematic:

The most important tools for national and societal progress are linked to progress in scientific research. Therefore, countries represented by the ministries of higher education and their educational institutions must restructure scientific research in line with the current developments and conditions, draw up national policies for research and development, and take bold decisions that make scientific research effective and effective in the field. Different parts of the world. Where scientific research is one of the main pillars of the university's work to achieve its objectives. Scientific research in Algeria today is witnessing a qualitative leap in terms of funding, as the Algerian state has allocated a very significant budget for it, which reflects the new conception it has attached to scientific research. However, this concern must be accompanied by amendments in the laws and legislation that conduct scientific research, and a new strategy should be developed that fits with the nature of the new stage. On that basis, one may ask the following questions: What is the reality of scientific research in Algeria? What are the obstacles to the development of Algerian scientific research?

3. The significance of research:

- 3.1.** The importance of this current study is reflected in the fact that it deals with a very important issue, which is the diagnosis of the reality of scientific research at the Algerian University, as it is one of the most important criteria for the progress and development of societies.
- 3.2.** The importance of this study also emerges by clarifying the difficulties and barriers that hinder the development of scientific research in Algeria.
- 3.3.** Lastly, the importance of this study appears by mentioning the mechanisms of development of scientific research in Algeria.

4. Study Objectives:

- 4.1.** Knowing the reality of scientific research in Algeria.
- 4.2.** Identifying the obstacles to scientific research in Algeria
- 4.3.** Mention the mechanisms for the development of scientific research in Algeria.

5. Study concepts:

5.1. Scientific research:

- 5.2.** Scientific research is defined as an organized collection of all the information available to the researcher on a particular topic and arranging it in a new way so that it supports the previous statement or becomes more authentic and clears (Fouad, 2021, p. 114).

Tuckman defines it as: an organized attempt to find answers or solutions to questions or problems facing individuals or groups in their positions and aspects of their lives (Hillway, 1964, p. 05).

Scientific research is defined as a method or organized attempt that can be directed to solving human problems using the scientific method and the rules of the scientific method in his quest to

increase his control over his environment, discover its phenomena and determine the relationships between phenomena (Alyan, 2000, p. 17).

The procedural concept of scientific research: It is an organized process of collecting data or information and analyzing it scientifically for a specific purpose.

5.3. University:

It is a place of organized scientific research that serves society in its dimension of global, material and moral development dimension (Touati, 2015, p. 14).

The university is defined as a general union of professors and students to provide security and protect them from exploitation so that they can devote themselves to studying or teaching (Obeidat, 2012, p. 11).

It is also known as the place where the free and open discussion takes place between the teacher and the learner to evaluate different ideas and concepts (Saqr Abdel Aziz Al-Gharib, 2005, p. 50).

The procedural concept of university: The University can be defined procedurally as a social institution that includes a group of individuals working to spread science and knowledge, discover creative energy, develop it and raise the quality of its services to serve the goals and objectives of the research.

6. Previous studies:

Some previous studies dealing with the subject of our research, including:

6.1. Study Barika and Masma'i: This study dealt with the research and innovation system through a historical, analytical study of the reality of scientific research in Algeria. I dealt with the subject through a general statistical survey of the development of research institutions and researchers in addition to showing the essential characteristics of the research system and the relationship between research and industry (Barika Al-Saeed, 2015, pp. 319-342).

6.2. Study noei: This study evaluated the policy of scientific research and technological development in Algeria to achieve national economic goals. The extent to which the various research indicators contribute to achieving the objectives of the monetary policy within the framework of the legal system for scientific research (Ezzedine, 2017, pp. 274-286).

6.3. Study Zemmouri and Mardaoui: This study also touched on the scientific research and technological development system in Algeria, but from the standpoint of the current situation and development strategies, as it touched on the research and development system through several indicators, the most important of which are students and university professors, the number of researchers and scientific publications, As well as investment in higher education, innovation, patents, the relationship between scientific research and industry and the obstacles to this relationship, as well as policies to support scientific research and technological development (Zemmouri Kamal, 2017, pp. 149-164).

6.4. Study Harouche and Tawalbeya: This study dealt with scientific research and development in Algeria from the two angles of reality and development requirements. The study showed the most critical needs that provide for the advancement of scientific research (Harouche Lamy, 2018, pp. 32-46).

These previous studies that were presented focused on the study of scientific research at the national level and used the comprehensive study approach, while our study works on diagnosing the reality of scientific research in Algeria, clarifying the obstacles that stand in the way of the development of scientific research, and providing suggestions and mechanisms for the development of scientific research in Algeria, and a study relied on the use of the case study approach because of the accurate analyzes that it can provide that comprehensive studies do not provide.

7. Characteristics of scientific research:

Good scientific research has good characteristics, including:

- Clarity the idea of research in the mind of the researcher so that the researcher has built a clear view of the problem or phenomenon that he wants to study before heading to the field of research, and this helps a lot in determining the dimensions of the elements of the subject be learned to avoid the researcher wasting time and effort (Ramzon, 1995, p. 20)
- Scientific research is characterized by objectivity and by providing rational and logical justifications. Among the things that should be referred to in the framework of objectivity is that the researcher's interest should be directed to choosing his hypotheses and not proving them.
- Scientific research uses logical justifications in its transition from one risk to another in dealing with a particular problem to reveal its various aspects.
- Scientific research includes accurate and precise observation of the phenomenon described quantitatively and through measurement tools that give results close to reality, especially in describing behavioral phenomena within different social situations.
- Scientific research focuses on arriving at theories or general principles through which predict future events by extending the relationships between variables within a specific framework (Ali Askar, 1998, p. 41).
- Defining the boundaries of the field of scientific research.
- The scientific research process requires dedication and time.
- Scientific honesty is the essence of the scientific research method, and it is more than just honesty in collecting information.
- It means attributing and returning information to its sources or people who reported such data. (Ramzon, 1995, p. 25).
- Scientific research is an integrated and purposeful system, based on linking the means and capabilities available to reach designed and legitimated.
- Scientific research is an organized activity, based on a set of values, rules, principles and methodological methods that are known and accepted scientifically and are constantly evolving. Scientific research is based on a clear vision and an effective link between means and ends. Scientific research is characterized by the pursuit of innovation and excellence in form, content and style (Buhanaf, 2022, p. 86).

- Scientific research has a cyclical character, meaning that reaching a solution to the research problem may be the beginning of the emergence of new research problems (Ribhi Mustafa Alyan, 2000, pp. 24-25).
- Repetition and generalization, where scientific research focuses on generalization, and generalization spares researchers the difficulty of explaining distinct behaviors.
- Instead of explaining how each student solves mathematical problems, scientists seek general explanations that combine all of the problem solving models used by students.
- This does not mean that all scientific research is centered around this theory.
- Some research, for example, aims to study a specific case without generalizing a goal in itself.
- We often find this clinical research. Repetition means the possibility of obtaining almost the same results if the same research steps are followed again, and they are the same, in certain circumstances and under similar objective conditions.
- Accuracy is an attribute that must accompany scientific research and include in its essence research from the beginning of thinking to the interpretation of the results (Zeitoun, 2004, p. 11).

8. Functions of scientific research:

- Provides knowledge to provide better conditions for human survival, security and well-being, and one does not need more than a moment to contemplate the modern means of luxury around him to witness the scientific effects of research.
- It helps the researcher to solve specific and general problems, and it also helps to be more efficient in judgment and safety assessment.
- He acquires the controls of the research methodology that enable him to evaluate what he is exposed to in terms of sayings, ideas and theories. He allows him to choose them, make sure of their advice, and not just receive them without scrutiny.
- Scientific research processes satisfy the exploratory and exploratory motives, self-realization, the research results, and the discovery and creativity it contains.
- The scientific research process contributes to the formation of the creative and productive individual who can contribute to the development and progress of his society (Bad Allah Zaid Al-Kilani, 2005, p. 16)

9. Scientific Research Inputs:

Among the most critical inputs of the scientific research system:

- The researcher and his research and scientific capabilities. Problems to be explored and solutions to be found.
- The equipment and the necessary material and human capabilities to conduct the research.
- Developments in society.
- How to fund research.
- The methods used to achieve the objectives of this scientific research (Mansi, 2003, p. 30).

10. Scientific Research output:

Scientific research outputs consist of:

- Development of scientific activities.
- Development of postgraduate studies and educational sectors.

- Solving societal problems. Contribute to achieving development.
- A new addition to the flag (Mansi, 2003, p. 31)

11. The directions required to develop scientific research in the Arab world:

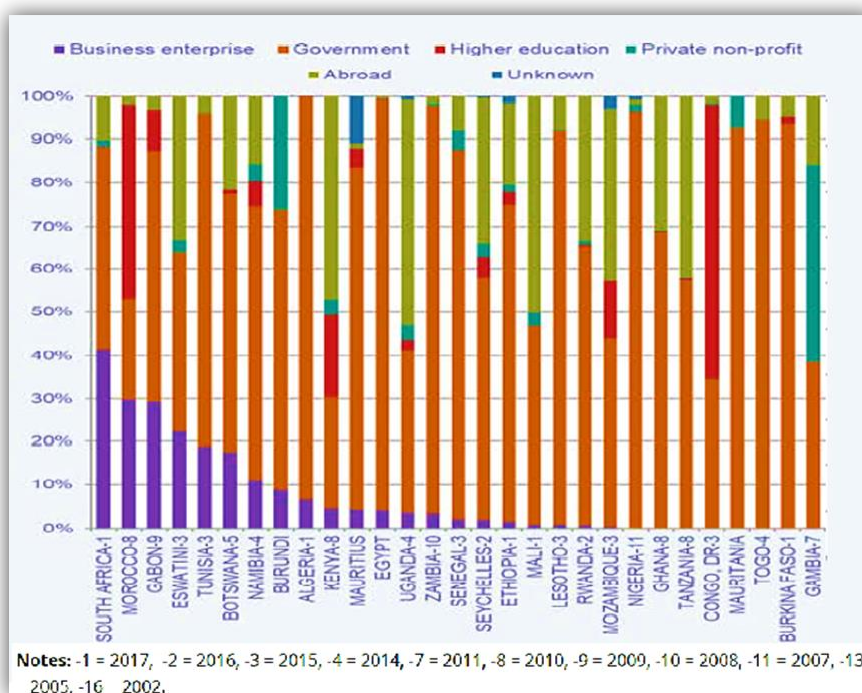
Specialists in this field emphasize several required directions that are suitable for the development and improvement of scientific research, as follows:

- Preparing the researcher to be able to practice scientific research, and this can be through developing the education system at different stages and developing the learner's research skills by adopting an approach of strategies such as the research, education strategy, and embracing continuous periodic evaluation of researchers, to know the extent to which their research is related to further development, Encouraging and rewarding talented and creative researchers whose research leads to innovative solutions to community problems.
- Building an information base to lay the sound foundations for scientific research, and for that to happen, a database must be established among Arab universities to ensure the publication of summaries of the research being carried out, in addition to the research that has been completed, to benefit from the proposals, recommendations and results of those research, And linking the information base to the needs of scientific research, and each university establishes a website, as well as e-mail to exchange ideas and experiences, break local and global borders and barriers, and present data and information between Arab universities and exchange them without generalization because facing facts, even if they are negative, is much better than covering them up and hiding them and providing Scientific devices and equipment, as well as libraries and education and information centers (Issam Tawfiq Qamar, 2008, p. 40)
- Providing funding alternatives for scientific research, and this can be achieved through the establishment of a joint fund financed by the public and private sectors to support and develop scientific research and open channels of communication between various institutions and sectors on the one hand, and universities, on the other hand, so that these institutions and sectors send their research needs The university, and at the same time finances part of it in return for benefiting from its results, may support the state's budget for scientific research.
- The political orientations of the state through the abolition of political guardianship over the academic community, the development of regulations, systems and legislation to protect intellectual property, and the dissemination of academic freedom within universities while respecting the results of the research on economic, political, cultural and social conditions.
- Work systems that encourage scientific research, and these systems are represented in spreading the culture of research within universities while providing a scientific climate that stimulates research within universities by providing the necessary capabilities for intellectual achievement and scientific application and setting a clear strategy for the research required for development and encouraging research teams to conduct such study And come up with mechanisms that are applicable and prepared for implementation.
- Restructuring the organizational interface within universities by considering the development and restructuring of the blind research system in Arab universities to the conditions of each country, setting up an accounting system that holds universities accountable for the results and goals that have been reached, the extent of their impact on international competition, and the

achievement of comprehensive quality standards In scientific research and democratic practice within universities, and giving researchers equal opportunities to devote themselves to scientific research, while developing a strategy to advance social, economic, political and cultural development (Issam Tawfiq Qamar, 2008, p. 42).

12. Funding for scientific research:

Fig.1. funding scientific research in Africa



Source: Prepared by the author based on the website of the UNESCO Institute for statistics, (STATISTICS, 2020)

From this figure, it becomes clear to us that Algeria is among the African countries that depend on government funding to a large extent in the scientific research sector, as the state allocates a budget for higher education sector estimated at 6% of the operating budget and 1.4% of the gross domestic product. While we note that commercial and private institutions have little role and do not care much about funding scientific research, and this true affects the quality and quality of scientific research in Algeria, and also affects the position of the Algerian university among international universities.

13. Financing scientific research in Algeria:

Prime Minister **Ayman bin Abd al-Rahman** confirmed that spending on scientific research and development had reached an average of more than 8 billion dinars per year, and this is under the title of the Special Fund for Scientific Research and Technological Development only, without calculating the financial allocations within the budgets of ministerial departments and other state institutions. He

explained that the field of financing was 100% dependent on the state budget, whether through the National Fund for Scientific Research and Technological Development (FNRSST) or state subsidies within the budgets allocated to sectoral research institutions. The Prime Minister added that these investments enabled the creation of many research base structures, numbered by the end of 2021, 1661 research laboratories, 29 centers, 43 research units and 24 experimental stations. To these structures are added several technological floors, technical platforms and incubators.

Ayman bin Abd al-Rahman referred to the significant development witnessed by some research centers. He singled out the centers affiliated with the Algerian Space Agency, which have made great strides through the various national space programs that have been prepared and implemented. Stressing that this agency is rightly considered a role model in applied research projects. Putting strategic mechanisms and tools in the service of developing vital sectors such as the agricultural sector. And providing it with technical solutions to monitor resources and protect against natural hazards and other areas of critical importance (Karim.M, 2022).

14. Percentage of researchers in research laboratories in Algeria:

According to the figures provided by the government official, the number of research professors involved in research laboratories increased from about 8000 research professors in the year 2000 to nearly 40,500 research professors at the end of 2021, an increase of more than 400 percent (elarabi, 2022).

The ability of a country to support a knowledge-based economy and promote technological development is measured by the number of Ph.D. Holders per 1000 people. Switzerland ranks first with 17, followed by Germany with 7, the United States of America with 6, then France with 3, while Algeria doesn't exceed 3 (Radwan, 2017, p. 312).

15. Structures of scientific research in Algeria:

As for the research structures of the higher education sector, Algeria has 19 research centers, 12 research units, and 6 National agencies for the development of research, in addition to more than 1440 research laboratories, as well as some centers and additional studies To a number of laboratories belonging to other sectors.

Table 1. Scientific research agencies in Algeria

Research agencies
1. National Agency for the Valorization of Research and Technological Development Results (ANVREDET)
2. Thematic Agency for Research in Science and Technology – El Harrach – Algiers
3. Thematic Agency for Research in Health Sciences – Oran
4. Thematic Agency for Research in Social and Human Sciences – Blida
5. Thematic Agency for Research in Nature and Life Sciences – Bejaia
6. Thematic Agency for Research in Biotechnology and Agrifood Sciences- Constantine

Source: Prepared by the author based on the website of the Ministry of Higher Education and Scientific Research - Algeria, (Research, 2022)

Through this table, it becomes clear to us that the scientific research sector contains only six research agencies. These numbers of agencies are few, while scientific research agencies are considered among the essential structures of scientific research in any country because they are the basis of creativity and scientific production. They work to revive the national economy and value research and studies inside and outside the country. The higher education sector in Algeria is in dire need of many scientific research agencies to develop further and contribute to building and improving the various political, economic and social fields in Algeria.

Table 2. Scientific Research centers in Algeria

Research centers
1. Renewable Energy Development Center (CDER) -Algiers
2. Research Center on Scientific and Technical Information (CERIST) -Algiers
3. Advanced Technology Development Center (CDTA) - Algiers
4. Industrial Technology Research Center (CRTI) – Algiers
5. Center for Scientific and Technical Research on the Development of the Arabic Language (CRSTDLA) - Algiers
6. Research Center in Applied Economics for Development (CREAD) - Algiers
7. Semiconductor Technology Research Center for Energy (CRTSE) -Algiers
8. Center for Research in Social and Cultural Anthropology (CRASC) –Oran
9. Center for Scientific and Technical Research on Arid Regions (CRSTRA) -Biskra
10. Center for Research in Biotechnology (CRBt) -Constantine
11. Center for Scientific and Technical Research in Physico –Chemical Analyzes (CRAPC) – Tipaza
12. National Center for Research in Islamic Sciences and Civilization – Laghouat
13. Amazigh Language and Culture Research Center (CRLCA)
14. Agrifood Technology Research Center
15. Agropastoralism Research Center
16. Environmental Research Center
17. Mechanics Research Center
18. Center for Pharmaceutical Sciences Research
19. Constantine Spatial Planning Research Center

Source: Prepared by the author based on the website of the Ministry of Higher Education and Scientific Research - Algeria, (Research, 2022)

Through this table, it becomes clear to us that the scientific research sector in Algeria contains 19 research centers, and this number is good. Research centers, but what draws attention here is that there is not a single research center that falls within the humanities and social sciences, which is the Research Center in Social and Cultural Anthropology (CRASC), which shows the position of the field of humanities and social sciences in scientific research and studies in Algeria. Therefore, more attention should be paid to this field and this type of research and studies because of its great importance in improving and developing scientific research in Algeria.

Table 3. Scientific Research units in Algeria

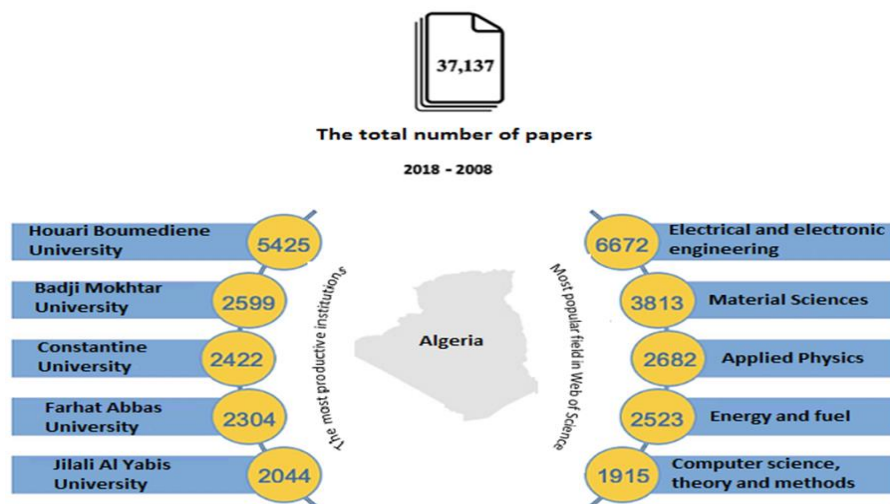
Research units
1. Cognitive Neurosciences – Speech Therapy – Phoniatics Research Unit (URNOP) – U. Algiers 2
2. Renewable Materials and Energies Research Unit (URMER) – U. Tlemcen
3. Social Sciences Research Unit – U. Batna 1
4. Emerging Materials Research Unit – U. Sétif 1
5. Human Resources Development Research Unit – U. Sétif 2
6. Modeling and Optimization of Systems Research Unit – U. Bejai
7. Environmental and Structural Molecular Chemistry Research Unit – U. Constantine 1
8. Research Unit Valorisation of natural resources, bioactive molecules and physico-chemical and biological analyzes – U. Constantine 1
9. Materials Science and Applications Research Unit – U. Constantine 1
10. Urinary and Biliary Stones Research Unit (URALUB) – U. Mostaganem
11. Social Sciences and Health Research Unit (GRAS) – U. Oran 2
12. Materials, processes and environment research unit – U. Boumerdès

Source: Prepared by the author based on the website of the Ministry of Higher Education and Scientific Research - Algeria, (Research, 2022)

Through this table, it becomes clear that Algeria contains 12 research units, which are diverse in fields and concerned with many social, medical, psychological, natural and other issues, which enriches and enhances the quality of scientific research in Algeria. The scientific research deserves attention, but these units are insufficient compared to some leading countries in the field of scientific research, so it is necessary to allocate a financial envelope by the Ministry of Higher Education and Scientific Research to open more research units, this is a service to the quality and development of scientific research.

It can be said based on this table that the research structures in Algeria are considered to a large extent and are in a stage of development and are always in need of funding not only from the state, but the private sector must pay more attention to research structures in Algeria to raise the quality of education and scientific research in Algeria.

Fig.2. Scientific papers published in Algeria between 2008-2018



Source: Prepared by the author based on the website of the Arab Scientific Society Organization (An overview of scientific research in Algeria, 2019)

Through this figure, it becomes clear that the field of great interest in scientific research is the field of electrical and electronic engineering, materials science, applied physics, energy and fuel, and computer science. As for the university institutions that are most productive and disseminate research, we find the **Houari Boumediene** University, which ranks first nationally, followed by the **Badji Mokhtar** University, then Constantine University, then **Farhat Abbas** University, and finally, we find the University of **Djilali El Yabes**. Through this reading, it becomes clear to us that the interest in scientific research in Algeria is focused more on engineering, electronic and energy sciences. On the other hand, we find **Houari Boumediene** University, one of the most prominent Algerian universities in the production of brains and scientific research, worthy of attention, especially in the fields above. But what attracts attention in this figure above is that the humanities and social sciences field does not receive much attention in Algeria, with evidence that it was not classified among the areas of most interest in scientific research in Algeria. At the same time, this field enjoys a respectable position in international universities.

16. Obstacles to scientific research in Algeria:

Several obstacles hinder the development of scientific research in Algeria, including:

- The absence of a realistic national program that defines goals and visions for the outputs of the research effort and the lack of clear policies, strategies, and plans for scientific research that define goals and priorities.
- The lack of applied content in many research projects and the separation of the goals that frame the research from the reality of society and its various problems.
- The absence of advisory bodies entrusted to them to carry out the tasks of employing research results and financing them on the horizon of turning them into profitable, productive and economic projects.

- The absence of actual databases that reveal the human and material research capabilities and monitor the accomplished work and studies to touch on issues and topics in a harmonious and balanced manner.
- Weakness of cooperation and partnership formulas between the various research institutions and laboratories on the one hand, and between these institutions and other institutions that sponsor development issues.
- Weakness of the country's productive economic sectors and lack of confidence in local competencies.
- The researchers' dependence on government funding and the small contribution made by the private sector to activate, modernize and finance scientific research.
- The weak budget allocated to scientific research is due to the lack of communication between the producers of scientific research and the beneficiaries of it.

17. Mechanisms for developing scientific research in Algeria:

To develop scientific research in Algeria, the following recommendations must be taken into account:

- More interest in the field of humanities and social sciences.
- Increasing state support and the need for the private sector to participate in financing scientific research in Algeria.
- Developing the scientific research system through digital transformation.
- Updating the legislation, laws and regulations regulating research and scientific publishing in Algeria.
- Spreading awareness of the importance of distinguished electronic scientific and global publishing with international researchers.
- Stimulating the movement of research, authorship, translation and scientific publishing, and motivating researchers financially and morally.
- Enhancing the global presence of Algerian university institutions and participating in various scientific conferences.
- Improving research structures and Algerian scientific journals and including them in the most prestigious global databases.
- Restore the Algerian immigrant's researchers to their homeland and provide a decent life for them and their families.
- Enhancing the values of creativity and innovation among researchers, This results in the preparation of solid scientific research that rises to the level of publication in prestigious international journals.

18. CONCLUSION:

From the above it becomes clear to us that this study is significant, as scientific research in Algeria seeks to achieve established goals through research centers, research units and scientific research agencies, and to occupy a prominent position in the Arab world, Africa and globally in light of the notable changes in the world, including economic, political and social, thanks to the influential role of institutions University and scientific research structures, based on the development of a strategy

for continuous improvement of the functions and objectives of scientific research, which is the main engine for comprehensive growth, and since scientific research is an essential function of the university, as it contributes with great force to advance the wheel of national development, it has become necessary to pay attention to research projects Al-Amy in general and researchers in particular, and providing all the required resources and means, including material and human, to advance national scientific research and push it towards the new global economic knowledge competition.

Based on the results obtained through this study, scientific research in Algeria is progressing for the better, according to a good plan and project. Still, scientific research in Algeria remains in need of effective mechanisms that are in line with political, economic and social changes. This is our study to secure an important position in the global scientific arena and elevate the Algerian university to the world's leading universities.

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