

## **A proposed Framework for Activating the Role of Scientific Research Laboratories in Activating Strategic Leadership in Algerian Universities**

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### **Abstract:**

The study aims to develop a proposed framework to activate the role of scientific research laboratories in activating strategic leadership in Algerian universities. To achieve the goal of the study, the descriptive analytical approach was adopted through the use of the questionnaire as a source for collecting data and information about the study variables, and distributing it to the study sample consisting of members of scientific research laboratories (laboratories heads - heads of research teams - faculty members - graduate students). Then the data was processed and analyzed statistically to test hypotheses and reach results with regard to describing the reality of scientific research laboratories in Algerian universities from the perspective of practicing strategic leadership, and the reality of the availability of the necessary requirements to activate strategic leadership in these laboratories. And then the results were analyzed, in the light of which a proposed framework was developed to activate the role of scientific research laboratories in activating strategic leadership. The study concluded that the lack of administrative, material and technical requirements for scientific research laboratories had an impact on the weakness of practicing the dimensions of strategic leadership. The study recommended the need to focus on quality and not quantity, so that the large number of research laboratories that burden the balance sheet must be eliminated and effective laboratories that provide an added value for scientific research and economic development and provide them with the necessary requirements.

**Keywords:** Strategic leadership, scientific research laboratories, pioneering leadership, entrepreneurial thinking, entrepreneurial culture.

### **Introduction:**

Interest in scientific research is due to it being one of the main drivers of comprehensive development. In this sense, universities can only contribute to development by activating the mechanisms of their research work (Kasi, 2018). In the field of revitalizing scientific research, Algeria issued a set of legislative texts, including Law No. 98/11 of August 22, 1998, which includes

the guiding law and the five-year program. For scientific research and technological development 1998-2002 (Hamzawy, 2017), regarding the establishment of a national plan for scientific research (PNR) and the establishment of a national fund for scientific research and technological development (FNR) responsible for funding research. Three intermediary bodies have also been founded in the form of agencies represented in the National Agency for the Development of Research in Health, the National Agency for the Development of University Research and the National Agency for the Evaluation of Scientific Research and Technological Development (Hamzawi, 2017). The latter agency aims to transfer research results and innovations towards the social and economic sectors and benefit from them. (Zaydi and Howeidi, 2016). Through the application of the aforementioned Law No. 98/11 and Executive Decree No. 99/244 of October 31, 1999, specifying the laws of establishment, organization and workflow within the research laboratory, each research professor or research assistant can propose a file to establish a research laboratory. The research laboratory undertakes the implementation of one or several topics for scientific research and technological development related to national research programs (Article 10 Law No. 98/11). The proposal must be submitted to the scientific council of the institution to which it belongs. (Law 98/11 -1998). Based on the provisions of Article 2 of Executive Decree No. 19-231 of August 13, 2019, specifying the modalities for establishing, organizing and running research laboratories, a research laboratory is a research entity that allows researchers who are dealing with similar problems to cooperate in order to implement one or more axis or one or more topics. For scientific research and technological development. (Guide to setting up, organizing and running laboratories, 2019).

Many industrialized countries have used many mechanisms and procedures to encourage the transfer of technology from university and national research centers and laboratories to industrial sectors and companies and to ensure the flow of scientific research results and inventions to these companies. Here we refer to the experience of an American university in which patents based on life sciences issued for research from 1988 to 1998 reached 6196 patents (Smith & Powell, 2003). The many changes witnessed by business organizations, including universities, in various technological, social and economic fields, prompted universities to work on awakening the strategic entrepreneurial spirit within them (Al-Ghamdi, 2021). Strategic leadership aims to add strategic value to the organization through its activities. At the level of higher education, strategic leadership in universities aims to obtain value by capitalizing knowledge, providing services with the required quality, and making both faculty members and university employees pioneers (Hussein and Bouderbala, 2020). This role places the responsibility on the academic leaders of the universities to practice the pioneering culture through the production of effective knowledge that contributes to the emergence of the spirit of pioneering work, updating the university's philosophy and the culture of its employees towards leadership, practicing an organizational culture based on the appreciation of new ideas and creativity, and creating the university environment to enhance the orientation of faculty members and researchers at the university towards a community of practice (Sarsour, 2019). It is noted that the role of the university is no longer limited to education only, but its reputation and academic fame are related to the extent of its production of scientific knowledge in various fields. The university and the knowledge and innovations it produces in the scientific field is the first basis through which differentiation takes place between countries (Zaydi and Al-Huwaidi, 2016). Among the advanced roles of universities are the employment of university scientific research in the service

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of production and development sectors and linking educational institutions with productive institutions (Hamzawy, 2017).

Based on the foregoing, research laboratories at the university level are supposed to be the fertile, qualified and competent land for the promotion of scientific research and support for training (Boutush and Tetila, 2014). The provisions of Article 2 of Executive Decree No. 19-231 of August 13, 2019, specifying the modalities for establishing laboratories research, organization and functioning of the tasks carried out by laboratories, including participation in the acquisition, control and development of new scientific and technological knowledge, contribution at its level to improving production techniques and methods as well as products, goods and services and their development, providing expertise and performing services for the benefit of others in accordance with the applicable regulation (Guideline on how to establish, organize and operate laboratories , 2019), along with the role played by the government in accordance with its policies. Universities can play a critical role in developing and disseminating new visions with innovative and technological potential, and can collaborate with innovative projects (Pereira & da. Silva, Porto, 2015). This requires faculty members and university employees to work on promoting scientific research and its role in supporting innovative projects and pioneering ideas. The research professor is constantly thinking about his activity, organizing his pedagogy and research, applying different research methods, and applying research results creatively (Lamanauskas & Augien, 2014). This calls for working to establish the requirements for strategic leadership at the university level, in which research laboratories are supposed to have an effective role in this. By examining the extent to which these laboratories practice the dimensions of strategic leadership and their availability on the requirements necessary to activate strategic leadership, a proposed framework can be developed to activate the role of these laboratories in establishing the requirements of strategic leadership in Algerian universities.

### **Related Literature and Hypotheses:**

When analyzing the current framework in which the world exists today, we find that there are forces from the economic, social, political, environmental, cultural and technological system that tend to influence in different ways on institutions of higher education and urge them to change, and which create challenges and necessities surrounding higher education institutions and urge them to think strategically and wise leadership ( Taylor & Taylor, 2010). Entrepreneurship is considered the most important of these entrances and a prerequisite for accessing the discovery of innovative and singular opportunities (Sarsour, 2019). Clark described the entrepreneurial universities as those universities that are based on organizational strategic initiatives and that take the initiative and risk for the sake of scientific enrichment, and take the lead to generate self-financial resources that enable them to maintain and enhance their academic position (Clark, 204). Strategic leadership has been adopted as an entry point for organizational development in government organizations. An example of this is the experience of King Saud University as one of the pioneering Gulf universities, which was characterized by adopting the approach of strategic leadership and through which it was able to reach advanced positions in the field of global competition and transform the university into the ranks of global leading universities (Al-Qahtani, 2012). In this context, a study was conducted by Sarsour (2019). It found that there is a positive, statistically significant correlation between the

average estimates of faculty members of the sample members of the degree of academic leaders' practice of strategic leadership at Al-Aqsa University and the level of quality of institutional performance. This means that the higher the degree to which academic leaders practice strategic leadership, the higher the quality level of institutional performance.

The dimensions of strategic leadership practice in higher education departments are determined in the light of a review of global experiences such as Lithuania and Australia in entrepreneurial leadership, entrepreneurial thinking and entrepreneurial culture (Al-Ghamdi, 2021). The aim is to encourage students to take interest in scientific research work under the leadership of highly qualified researchers, which contributes to professional development and application of research results in a real professional environment (Lamanauskas & Augien, 2014). Entrepreneurial leadership is defined as the leadership that builds a clear vision for the organization and works to mobilize the energies of workers behind this vision and their contribution to achieving the strategic value of the organization (Salah al-Din, 2020). Whereas, entrepreneurial thinking represents a mental activity that aims to research and reach new and creative results and solutions in all areas. Scientific fields and their use to solve existing problems and find appropriate solutions (Khasawneh, 2015). Entrepreneurial culture represents one of the tasks that helps change and renewal, as it works to find harmony among all members of the organization in achieving opportunities for raising that help the organization to find projects and new ideas (Boderbala and Hussein, 2020).

Accordingly, through this study, a proposed framework will be developed to activate the role of scientific research laboratories, as they are one of the university's bodies in activating the requirements of strategic leadership in the Algerian university based on the following hypotheses:

**Hypothesis 1:** The practice of strategic leadership dimensions in scientific research laboratories in Algerian universities is of a low level.

**Hypothesis 2:** There is a discrepancy in practice between the dimensions of strategic leadership in scientific research laboratories in Algerian universities.

**Hypothesis 3:** Scientific research laboratories in Algerian universities do not meet the requirements necessary to activate strategic leadership.

### **Methodology of the Research:**

In order for the study to be of sound construction, the appropriate curriculum should be determined that ensures the logical sequence of ideas, and requires following a number of tools in order to achieve the desired goals of their achievement. The current study relied on the descriptive analytical approach, which is the most appropriate to achieve its objectives. A questionnaire was used as a source for collecting data and information about the study variables, and distributing them to the study sample. Then the data was processed and analyzed statistically to test hypotheses and reach results with regard to describing the reality of scientific research laboratories in Algerian universities from the perspective of practicing strategic leadership.

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### Study Population:

The study population consists of all members of scientific research laboratories (laboratories heads - heads of research teams - faculty members - graduate students) in all disciplines and in all Algerian universities. Algeria has 1,470 research laboratories distributed among various national universities, according to what the Minister of Higher Education and Scientific Research stated at a press conference in 2020. The achievements of these laboratories are periodically evaluated. Accordingly, over the past three years, about 100 laboratories were closed. This is not an “event” that deserves praise or condemnation, because closing laboratories and opening others is a natural matter that comes logically as a result of the assessment.

### Sample of the Study:

The electronic link of the questionnaire was sent to 80 members of scientific research laboratories (laboratories heads - heads of research teams - faculty members - graduate students) in 10 universities, namely, University of Algiers 3 in Algiers, University of Houari Boumediene in Algiers, University of M’hamed Bougherra in Boumerdes, Akli Mohand and Hajj University in Bouira, Saad Dahleb University in Blida, El Bachir Brahimi University in Bordj Bou Arreridj, Mouloud Maamari University in Btzi Ouzou, University of Martyr Hamma Lakhdar in El Wadi, Hajj Lakhdar University in Batna, Farhat Abbas University in Setif. 72 questionnaires were retrieved with the exclusion of 3 questionnaires because they were not suitable for analysis, bringing the number of questionnaires that can be analyzed to 69 with a rate of 86.27%.

### Tools of the Study:

The IBM SPSS 24 program was relied on for the purpose of analyzing the data obtained through the retrieved and accepted questionnaires for analysis. This program helps to calculate the arithmetic mean to know the public opinion of the answers of the sample members and the standard deviation to find out the degree of dispersion of the values from their arithmetic mean.

In order to find out the general trend of the opinions of the study sample members, the questionnaire was prepared according to the Five-Year Likert Scale.

**Table 01: Likert Five Scale**

Classification	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Class	5	4	3	2	1
Category	4,2 – 5	3,4 – 4,19	2,6 – 3,39	1,8 – 2,59	1 – 1,79

**Source:** Prepared by the researchers

### The general stability test of the study tool:

In order to ensure the stability of the study tool, the Alpha Cronbach scale is used. The closer the value of this scale is to one, the higher the stability. By applying this measure to the study tool by IBM ISPSS 24 program, similar results were obtained in the following table:

**Table No. 02: The value of the general stability coefficient (Alpha Cronbach)**

Number of variables	Alpha Cronbach's value
<b>47</b>	<b>0.853</b>

**Source:** The table was prepared based on the outputs of SPSS.

The results in the above table show that the value of the general Alpha Cronbach coefficient for the study tool was 0.853. Thus, it exceeds the good average of this coefficient (0.8) and approaches one, and from this it can be said that the stability of the applied tool to accomplish this study is excellent, and it is valid for analyzing the results and testing hypotheses, and its results are generalizable.

**Analysis and discussion of the study results:**

The data will be analyzed to know the general orientation of the study sample members in order to reach convincing answers and achieve the objective of this study, which is to know the extent to which scientific research laboratories in Algerian universities practice the dimensions of strategic leadership on the one hand, and on the other hand, to know the availability of scientific research laboratories on the requirements necessary to activate strategic leadership.

**Analysis of the results of the first axis: The extent to which the dimensions of strategic leadership are practiced in scientific research laboratories in Algerian universities**

To identify the degree of practicing the dimensions of strategic leadership in scientific research laboratories in Algeria, the arithmetic averages and the standard deviation of the answers of the study sample members were calculated for each of the dimensions of strategic leadership (entrepreneurial leadership, entrepreneurial thinking, entrepreneurial culture).

**Table (3): Extent of practicing the leadership dimension in scientific research laboratories in Algerian universities**

Paragraphs of the entrepreneurial leadership dimension	Answers					Statistical indicators		
	Strongly agree	Agree	Neutral	Disagree	Strongly disagreed	Arithmetic mean	Standard deviation	General direction
The administrative leadership in research laboratories is working to instill the philosophy of leadership in the university.	1	3	8	26	31	1,80	0,92	Disagree
	1,45 %	4,35%	11,59 %	37,68 %	44,93 %			

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The administrative leadership in research laboratories encourages members to come up with creative ideas.	2	2	50	13	2	2,84	0,66	Neutr al
	2,90 %	2,90%	72,46 %	18,84 %	2,90%			
The administrative leadership encourages the production of scientific research that includes pioneering ideas.	2	2	48	15	2	2,81	0,67	Neutr al
	2,90 %	2,90%	69,57 %	21,74 %	2,90%			
The administrative leadership works to provide a suitable climate for adopting pioneering ideas and exploiting talents.	2	2	2	44	19	1,90	0,83	Disag ree
	2,90 %	2,90%	2,90 %	63,77 %	27,54 %			
Administrative leadership works to transform the results of scientific research and pioneering ideas into productive units.	0	7	4	34	24	1,91	0,90	Disag ree
	0,00 %	10,14 %	5,80 %	49,28 %	34,78 %			
Encouraging the governmental and private productive sectors to purchase patents and exploit the results of scientific research.	0	4	7	33	25	1,86	0,83	Disag ree
	0,00 %	5,80%	10,14 %	47,83 %	36,23 %			
Registering patents and scientific discoveries for researchers on the international information network in the most widespread global languages in the world.	0	0	2	32	35	1,52	0,56	Stron gly Disag ree
	0,00 %	0,00%	2,90 %	46,38 %	50,72 %			
Establishing a system of contracts between research laboratories and research beneficiary bodies so that scientific services and research results can be marketed.	0	0	4	27	38	1,51	0,61	Stron gly Disag ree
	0,00 %	0,00%	5,80 %	39,13 %	55,07 %			
The informant's performance is periodically evaluated objectively.	2	2	42	17	6	2,67	0,80	Neutr al
	2,90 %	2,90%	60,87 %	24,64 %	8,70%			
The overall average of the entrepreneurial leadership dimension						2,09	0,13	Disag ree

**Source:** The table was prepared based on the outputs of SPSS.

Table (03) shows that the practice of entrepreneurial leadership at the level of research laboratories in Algerian universities is weak. The arithmetic mean of the answers of the study sample in general was 2.09 and the standard deviation was 0.13. This indicates the lack of pioneering leadership among directors of research laboratories and heads of research teams working to

encourage creativity, innovation and excellence among members of the scientific research laboratory, including faculty members and students.

**Table No. 04: The extent to which entrepreneurial thinking is practiced in scientific research laboratories in Algerian universities**

Paragraphs of entrepreneurial thinking dimension	Answers					Statistical indicators		
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Arithmetic mean	Standard deviation	General direction
The members of the research laboratory work to put forward innovative ideas in the field of scientific research.	5	51	0	6	7	3,59	1,09	Agree
	7,25 %	73,91 %	0,00 %	8,70 %	10,14 %			
The members of the research laboratory have a clear vision of activities that lead to creativity and excellence.	0	0	9	39	21	1,83	0,64	Disagree
	0,00 %	0,00 %	13,04 %	56,52 %	30,43 %			
The members of the research laboratory, both faculty and students, strive to provide the best in the field of scientific research and discoveries.	11	24	22	7	5	3,42	1,10	Agree
	15,94 %	34,78 %	31,88 %	10,14 %	7,25 %			
The members of the research laboratory have an interest in the requirements of leadership in research.	3	3	40	17	6	2,71	0,86	Neutral
	4,35 %	4,35 %	57,97 %	24,64 %	8,70 %			
Faculty members encourage student researchers to research new and distinct topics.	13	22	22	7	5	3,45	1,13	Agree
	18,84 %	31,88 %	31,88 %	10,14 %	7,25 %			
The leaders of the research teams work to discover the pioneering students and include them in the research teams.	10	28	16	10	5	3,41	1,13	Agree
	14,49 %	40,58 %	23,19 %	14,49 %	7,25 %			
Urging faculty members and students to participate in events (conferences, seminars, ....) related to entrepreneurship.	15	23	16	10	5	3,48	1,20	Agree
	21,74 %	33,33 %	23,19 %	14,49 %	7,25 %			
The members of the research laboratory are ready to face the risks arising from the introduction of new and individual ideas	0	0	7	40	22	1,78	0,62	Strongly disagree
	0,00 %	0,00 %	10,14 %	57,97 %	31,88 %			
The members of the research	8	32	14	10	5	3,41	1,10	Agree



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laboratory have a spirit of initiative to discuss pioneering ideas.	11,59 %	46,38 %	20,29 %	14,49 %	7,25%			e
The overall average of the entrepreneurial thinking dimension						3,01	0,22	Neutr al

**Source:** The table was prepared based on the outputs of SPSS.

It is noted from Table No. 04 that the practice of entrepreneurial thinking at the level of research laboratories in Algerian universities is average. The arithmetic mean of the answers of the study sample in general was 3.01 and the standard deviation was 0.22. This indicates the attempt of members of research laboratories, including laboratory directors, heads of research teams, faculty members and students, to make an effort with regard to creativity and innovation in the field of scientific research, to include pioneering students in research teams, and to encourage scientific research in new and distinct research topics. The arithmetic mean of the paragraph "Members of the research laboratory have a clear vision of the activities that lead to creativity and excellence" with a value of 1.83, which means the lack of a clear vision of the activities that lead to creativity and excellence, which is a reason that hinders the process of entrepreneurial thinking, as well as the absence of taking risks from the members of the scientific research lab in putting forward the pioneering ideas, where the arithmetic average of the paragraph of the members of the research lab was willing to face the risks resulting from putting forward new and single ideas by 1.78, which is a very weak degree.

**Table (05): The extent to which entrepreneurial culture is practiced in scientific research laboratories in Algerian universities**

Paragraphs of the entrepreneurial culture dimension	Answers					Statistical indicators		
	Stron gly agree	Agree	Neutr al	Disag ree	Stron gly disagr ee	Arith metic mean	Stand ard deviat ion	Gene ral direct ion
Research laboratories produce effective knowledge that contributes to the emergence of the spirit of pioneering work.	2	2	17	35	13	2,20	0,88	Disag ree
	2,90 %	2,90%	24,64 %	50,72 %	18,84 %			
Practicing an organizational culture based on the appreciation of new ideas and creativity.	0	0	6	37	26	1,71	0,62	Stron gly disag ree
	0,00 %	0,00%	8,70 %	53,62 %	37,68 %			
Adopting new ideas and innovative processes in scientific research.	2	3	39	19	6	2,65	0,82	Neutr al
	2,90 %	4,35%	56,52 %	27,54 %	8,70%			
Organizing seminars and meetings to expand the	15	25	14	10	5	3,51	1,20	Agre e
	21,74	36,23	20,29	14,49	7,25%			

university's members' perceptions of leadership.	%	%	%	%				
Encouraging members to participate in national and international entrepreneurial events.	0	0	3	32	34	1,55	0,58	Stron ngly disag ree
	0,00 %	0,00%	4,35 %	46,38 %	49,28 %			
Enhancing the faculty members' orientation towards a community of entrepreneurship practice.	0	0	2	26	41	1,43	0,56	Stron gly disag ree
	0,00 %	0,00%	2,90 %	37,68 %	59,42 %			
Employing modern knowledge to make research laboratories a basis for discovering pioneering ideas.	0	2	10	32	25	1,84	0,78	Disag ree
	0,00 %	2,90%	14,49 %	46,38 %	36,23 %			
Intensification of collective efforts among members of the research laboratory with a creative mind.	4	4	40	12	9	2,74	0,96	Neutr al
	5,80 %	5,80%	57,97 %	17,39 %	13,04 %			
Honoring distinguished members to encourage innovation, creativity and excellence.	6	5	20	21	17	2,45	1,19	Disag ree
	8,70 %	7,25%	28,99 %	30,43 %	24,64 %			
The overall average of the entrepreneurial culture dimension						2,23	0,24	Disag ree

**Source:** The table was prepared based on the outputs of SPSS.

It is noted from Table No. 05 that the practice of entrepreneurial culture at the level of research laboratories in Algerian universities is weak. The arithmetic mean of the answers of the study sample in general was 2.23 and the standard deviation was 0.24. This indicates the absence of a culture of leadership among the majority of members in scientific research laboratories. The arithmetic averages for all dimension items ranged between 1.43-2.74, with the exception of the paragraph of organizing seminars and meetings to broaden the university members' perceptions of leadership, where its arithmetic average was 3.51. This indicates the formality of these seminars and meetings, and their lack of linking them to the goals of establishing an entrepreneurial culture in the university community. In order to find out the degree of disparity in the practice of the dimensions of strategic leadership in scientific research laboratories in Algerian universities, the dimensions were arranged according to the arithmetic mean and standard deviation for each dimension. The following table shows the order of the degree of practice for the three dimensions.

**Table No. 06: The degree of practicing the dimensions of strategic leadership in scientific research laboratories in Algerian universities**

Dimensions of strategic leadership	Arithmetic mean	Standard deviation	General direction	Rank
Pioneering leadership	2,09	0,13	Disagree	3
Entrepreneurial	3,01	0,22	Neutral	1

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thinking				
entrepreneurial culture	2,23	0,24	Disagree	2
The general arithmetic mean	2,48	0,06	Disagree	

**Source:** Prepared by the researchers

It is noted from the above table that the level of practicing the dimensions of strategic leadership is weak, in the scientific research laboratories in Algerian universities, with a discrepancy in the degree of weakness among the dimensions of strategic leadership. The degree of practicing entrepreneurial thinking dimension came in the first place with an arithmetic mean of 3.01, followed by the degree of practicing entrepreneurial culture with an arithmetic mean of 2.23, and in the last rank comes the degree of practicing after entrepreneurial leadership, with an arithmetic average of 2,09. This confirms the validity of the first hypothesis, “The practice of the dimensions of strategic leadership in scientific research laboratories in Algerian universities is of a weak level,” as well as the validity of the second hypothesis “there is a disparity in practice between the dimensions of strategic leadership in scientific research laboratories in Algerian universities.” This may be due to poor planning and management of these laboratories and randomness in choosing specializations and in testing the research competencies that enrich them, which results in the absence of strategic goals that seek to establish the requirements of strategic leadership and go towards providing scientific research that contains innovations and innovations.

**The second axis: The availability of scientific research laboratories in Algerian universities on the requirements necessary to activate strategic leadership**

To identify the availability of scientific research laboratories in Algerian universities on the requirements necessary to activate strategic leadership, the arithmetic averages and the standard deviation of the answers of the study sample members were calculated for each of the administrative requirements, human requirements, and material and technical requirements.

**Table (07): The availability of scientific research laboratories in Algerian universities on the administrative requirements to activate strategic leadership**

Paragraphs of administrative requirements dimension	Answers					Statistical indicators		
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Arithmetic mean	Standard deviation	General direction
Establishing a mechanism by which faculty members are committed to include the pioneering aspects in the formation of research teams.	1	1	5	29	33	1,67	0,80	Strongly disagree
	1,45 %	1,45 %	7,25 %	42,03 %	47,83 %			
The presence of a consulting center in each research laboratory	0	0	1	17	51	1,28	0,48	Strongly
	0,00	0,00 %	1,45	24,64	73,91			

to enable the entrepreneurial skills of faculty members and students.	%		%	%	%			disagree
Develop mechanisms to develop partnership between scientific research laboratories and economic institutions.	12	31	18	3	5	3,61	1,06	Agree
	17,39 %	44,93 %	26,09 %	4,35%	7,25%			
Provide a plan to familiarize faculty members with the legal and regulatory aspects necessary to carry out pioneering projects.	0	2	3	16	48	1,41	0,71	Strongly disagree
	0,00 %	2,90%	4,35 %	23,19 %	69,57 %			
Signing cooperation agreements with experts specialized in pioneering projects to benefit from them.	4	5	25	18	17	2,43	1,12	Disagree
	5,80 %	7,25%	36,23 %	26,09 %	24,64 %			
Signing agreements with financing institutions such as banks to finance pilot projects for members.	0	0	1	3	65	1,07	0,31	Strongly disagree
	0,00 %	0,00%	1,45 %	4,35%	94,20 %			
Motivating competencies to continue in scientific research laboratories.	2	2	7	37	21	1,94	0,89	Disagree
	2,90 %	2,90%	10,14 %	53,62 %	30,43 %			
The overall average of the administrative requirements dimension						1,92	0,29	Disagree

**Source:** The table was prepared based on the outputs of SPSS.

It is noted from Table No. 07 that the administrative requirements of scientific research laboratories in Algerian universities are not available to activate strategic leadership. The arithmetic mean of the answers of the study sample members to the administrative requirements phrases was 1.92 and the standard deviation was 0.29, with a weakness of the arithmetic mean of all the phrases included in it after the administrative requirements. This means that there is no mechanism or plan to support the pioneering ideas of the members of the research laboratory.

**Table (08): The availability of scientific research laboratories in Algerian universities on the human requirements to activate strategic leadership**

Paragraphs after human requirements	Answers					Statistical indicators		
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Arithmetic mean	Standard deviation	General direction
The presence of member specialists in the pilot projects to motivate the research students on	11	25	19	7	7	3,38	1,18	Neutral
	15,94 %	36,23 %	27,54 %	10,14 %	10,14 %			

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the pioneering projects.								
Availability of a research laboratory for members who are able to implement entrepreneurial education programs.	35	22	4	6	2	4,19	1,07	Agree
	50,72 %	31,88 %	5,80 %	8,70%	2,90%			
The research laboratory provides training programs for members on entrepreneurial work.	1	1	21	35	11	2,22	0,78	Disagree
	1,45 %	1,45%	30,43 %	50,72 %	15,94 %			
The research laboratory has an executive body that is a link between members and economic institutions.	10	27	19	4	9	3,36	1,20	Neutral
	14,49 %	39,13 %	27,54 %	5,80%	13,04 %			
Availability of the research laboratory on specialized members who are able to provide support and advice in the pioneering field for faculty members and students.	35	22	4	6	2	4,19	1,07	Agree
	50,72 %	31,88 %	5,80 %	8,70%	2,90%			
Availability of members who are able to build positive attitudes among students towards entrepreneurship and self-employment.	8	40	9	7	5	3,57	1,06	Agree
	11,59 %	57,97 %	13,04 %	10,14 %	7,25%			
Scientific research laboratories are available to creative and innovative members.	3	42	11	8	5	3,43	1,01	Agree
	4,35 %	60,87 %	15,94 %	11,59 %	7,25%			
The general average of the dimension of human requirements						3,48	0,14	Agree

**Source:** The table was prepared based on the outputs of SPSS.

It is noted from Table No. 08 a discrepancy in the availability of human requirements necessary to activate strategic leadership in scientific research laboratories in Algerian universities. The two paragraphs “Availability of the research laboratory for members who are able to implement entrepreneurial education programs” and “Availability of the research laboratory for specialized members who are able to provide support and consultations in the pioneering field for faculty members and students” came with the same arithmetic average of 4.19. This indicates the availability of faculty members specialized in entrepreneurship who are familiar with the basics of entrepreneurial education and are able to provide support and consultations in the pioneering field in some scientific research laboratories. Then it is followed by a paragraph about the availability of members who are able to build positive attitudes among students towards entrepreneurship and self-employment with an average of 3.57, then a paragraph about the availability of scientific research laboratories on creative and innovative members with an average of 3.43, and then a paragraph about the presence of specialists from members in pioneering projects to stimulate Students researching

entrepreneurial projects with an average of 3.38, and a percentage of which is less than one paragraph. The research laboratory is available to an executive body that is a link between members and economic institutions. While the lowest arithmetic mean for the item "The research laboratory provides training programs for members on entrepreneurial work" was 2.22. This means the availability of pioneering competencies from faculty members who are members of scientific research laboratories and who are able to spread the pioneering culture and adopt and develop pioneering ideas, but these competencies need training on how to embody these ideas and turn them into practical reality, which is explained by the general arithmetic mean of the 3.48 dimension phrases.

**Table (09): The availability of scientific research laboratories in Algerian universities on the material and technical requirements to activate strategic leadership**

Paragraphs after the material and technical requirements	Answers					Statistical indicators		
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Arithmetic mean	Standard deviation	General direction
Scientific research laboratories are available in laboratories and workshops to hold seminars and meetings.	1	1	9	37	21	1,90	0,79	Disagree
	1,45 %	1,45%	13,04 %	53,62 %	30,43 %			
Scientific research laboratories have technological equipment to facilitate the presentation and discussion of pioneering ideas.	3	5	15	38	8	2,38	0,94	Disagree
	4,35 %	7,25%	21,74 %	55,07 %	11,59 %			
Scientific research laboratories have a database on the needs of the local and global market and the pioneering ideas it requires.	0	0	9	23	37	1,59	0,71	Strongly disagree
	0,00 %	0,00%	13,04 %	33,33 %	53,62 %			
Scientific research laboratories provide the necessary financial capabilities to benefit from scientific research.	1	3	15	39	11	2,19	0,81	Disagree
	1,45 %	4,35%	21,74 %	56,52 %	15,94 %			
Scientific research laboratories give rewards and grants to the owners of pioneering ideas.	0	0	3	42	24	1,70	0,55	Strongly disagree
	0,00 %	0,00%	4,35 %	60,87 %	34,78 %			
Scientific research laboratories have the capabilities to attract members specialized in pioneering activities.	0	2	5	44	18	1,87	0,66	Disagree
	0,00 %	2,90%	7,25 %	63,77 %	26,09 %			
The overall average of the physical and technical requirements dimension						1,94	0,13	Disagree

**Source:** The table was prepared based on the outputs of SPSS.

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Table (09) shows the weakness of the material and technical capabilities necessary to activate the strategic leadership in the scientific research laboratories in Algerian universities. The dimension paragraphs came with an arithmetic mean of 1.94, which is the same level recorded by all the dimension paragraphs, where the arithmetic averages of the dimension paragraphs ranged between 1.59 - .2.38. This means less spending on scientific research, innovation and motivation.

In order to find out the degree of disparity in the availability of the necessary requirements in the scientific research laboratories to activate the strategic leadership, the dimensions of the requirements were arranged according to the arithmetic mean and standard deviation for each dimension in the following table.

**Table (10): The degree of availability of the necessary requirements in scientific research laboratories in Algerian universities to activate strategic leadership**

Dimensions of strategic leadership	Arithmetic mean	Standard deviation	General direction	Rank
Administrative requirements	1,92	0,29	Disagree	3
human requirements	3,48	0,14	Agree	1
Physical and technical requirements	1,94	0,13	Disagree	2
General arithmetic mean	2,45	0,09	Disagree	

**Source:** Prepared by the researchers.

The above table reflects that the availability of human requirements came in the first place with an arithmetic mean of 3.48, then followed by the material and technical requirements with an arithmetic mean of 1.94, and in the last rank is the administrative requirements arithmetic mean 1.92. However, in general, the scientific research laboratories in Algerian universities are witnessing a weakness in the requirements necessary to activate their role in strategic leadership. The reason is primarily due to the lack of effective management, whether at the level of scientific research laboratories or at the level of universities, that plans for the pioneering approach and sets mechanisms to support and encourage pioneering ideas and adopt them on the one hand, and on the other hand, the lack of rational policies to encourage and motivate the members of the faculty members in the research laboratories to have an entrepreneurial culture and a pioneering thinking style. This confirms the validity of the third hypothesis, "The scientific research laboratories in Algerian universities do not have the necessary requirements to activate strategic leadership."

Using the statistical program IBM SPSS 24, the Pearson correlation coefficient was calculated between the paragraphs of the dimensions of the practice of strategic leadership and the dimensions of the requirements needed to activate strategic leadership to determine the factors behind the weak activation of the scientific research laboratories for strategic leadership.

**Table (11): The results of the correlation between the extent to which the dimensions of strategic leadership are practiced in scientific research laboratories in Algerian universities and the availability of scientific research laboratories in Algerian universities on the requirements necessary to activate strategic leadership**

Dimensions of practicing strategic leadership	Availability of the requirements to activate strategic leadership	Significance value	Correlation coefficient	Pearson test results analysis
Pioneering leadership	Administrative requirements	0.00	0,21	The significance of Pearson's coefficient is less than 0.05 and its value is positive, and therefore there is a linear correlation between entrepreneurial leadership and administrative requirements.
	Human requirements	0.04	0.21	The significance of Pearson's coefficient is less than 0.05 and its value is positive, and therefore there is a linear correlation between entrepreneurial leadership and human requirements.
	Physical and technical requirements	0.00	0.06	The significance of the Pearson coefficient is less than 0.05 and its value is positive, and therefore there is a linear correlation between the entrepreneurial leadership and the material and technical requirements.
Entrepreneurial thinking	Administrative requirements	0.00	0.31	The significance of Pearson's coefficient is less than 0.05 and its value is positive
	Human requirements	0.00	0.25	The significance of Pearson's coefficient is less than 0.05 and its value is positive
	Physical and technical requirements	0.00	0.18	The significance of the Pearson coefficient is less than 0.05 and its value is positive
Entrepreneurial culture	Administrative requirements	0.00	0,17	The significance of the Pearson coefficient is less than 0.05 and its value is positive



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	Human requirements	0.00	0.51	The significance of the Pearson coefficient is less than 0.05 and its value is positive
	Physical and technical requirements	0.00	0,13	The significance of the Pearson coefficient is less than 0.05 and its value is positive

**Source:** The table was prepared based on the outputs of SPSS.

Table (11) shows that there is a strong correlation between all dimensions of strategic leadership and the dimensions of the requirements necessary to activate strategic leadership. This explains the reason for the weak practice of the dimensions of leadership and strategic leadership in scientific research laboratories in Algerian universities due to the absence of the necessary requirements.

**Results:**

Based on the previous analyses, the study reflects the following results:

- Weakness in the practice of the dimensions of strategic leadership by scientific research laboratories in Algerian universities, with a discrepancy in practice between the dimensions of entrepreneurial leadership, entrepreneurial culture and pioneering thinking.
- There is a lack of the necessary requirements (administrative requirements - material and technical requirements) needed by scientific research laboratories to activate strategic leadership, despite the availability of a competent and specialized human element.
- The main reason for the weak contribution of scientific research laboratories in activating strategic leadership in Algerian universities is primarily due to the absence of an effective administrative leadership that undertakes to develop a clear vision of how to transform into strategic and pioneering leadership in education and scientific research.
- The lack of support, training and motivation for faculty members in the field of creativity and excellence is a reason for their failure to practice entrepreneurial thinking.

**The proposed framework for activating the role of scientific research laboratories in activating strategic leadership in Algerian universities:**

Based on the results of this study, it is necessary to work on developing a set of steps necessary to activate and establish the dimensions of strategic leadership, which are recommended to be followed by scientific research laboratories in Algerian universities to advance their role in the development of scientific research and the development of the role of the Algerian university in contributing to achieving development economic sectors.

**The objectives of the proposed framework:**

The proposed framework aims to achieve the following:

- Pushing scientific research laboratories to contribute to establishing the dimensions of leadership in universities.
- Developing scientific research and encouraging creative and distinguished research.
- Contributing to the transfer of scientific research results to economic institutions to benefit from.
- Pushing scientific research laboratories to fund themselves by marketing their pioneering ideas and the results of their scientific research.
- Making scientific research laboratories the appropriate place to contain, nurture and develop pioneering and creative ideas.
- Pushing scientific research laboratories to conclude partnerships and agreements with local and international bodies looking for pioneering ideas.
- Encouraging the effectiveness of scientific research laboratories by linking their continuity to their performance and the extent of their contribution to activating strategic leadership.
- Pushing scientific research laboratories to contribute to the development of a vision that aims to shift towards strategic leadership.
- Providing an encouraging and advanced research environment that attracts talents and limits their emigration.

**Those responsible for implementing the proposed framework:**

Responsibility for implementing the proposed framework includes everyone related to the university, whether teaching and learning, scientific research, academic supervision, administrative leadership, etc.

**The first category:** It is represented by the Ministry of Higher Education and Scientific Research and its various departments.

**The second category:** Universities with their entire administrative staff and officials, including presidents, deans and vice deans.

**The third category:** This includes members of scientific research laboratories, including heads of laboratories, heads of research teams, faculty members, and student researchers.

**Requirements of the Proposed Framework:**

The implementation of the proposed framework requires the availability of a set of necessary requirements without which it is impossible to implement any proposal, including:

**Administrative requirements:** Effective administrative leadership, administrative procedures, supervisory bodies, a strategic plan.

**Human requirements:** Specialists in entrepreneurship from faculty members, experts and consultants in entrepreneurship.

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**Material and technical requirements:** Laboratories and workshops for holding seminars and meetings - modern technological and technical equipment - funding sources for pioneering ideas - grants and rewards for owners of pioneering ideas and distinguished scientific research.

### **Proposed framework steps :**

To activate the role of scientific research laboratories in activating strategic leadership, effective and targeted measures must be taken, starting with the Ministry of Higher Education and Scientific Research, as it is the authority responsible for these laboratories, then at the levels of universities and their laboratories.

### **Suggestions at the level of the Ministry of Higher Education and Scientific Research :**

- Forming units to restructure scientific research laboratories and considering their performance, tasks and roles.
- Forming units to create a clear vision of how to shift to strategic leadership in universities and scientific research.
- Considering the budgets allocated to scientific research laboratories and linking them to performance, innovation and excellence.
- Setting objective criteria for evaluating the performance of scientific research laboratories that include pioneering aspects.
- Forming control units to track the performance of scientific research laboratories and evaluate their annual plans.
- Providing financial support to researchers who have pioneering ideas through scientific research laboratories and encouraging them to represent them on the ground.
- Creating national information centers, data banks as a reference for the researcher to obtain all the data and information he needs in his research.
- Establishing international and regional cooperation networks in the field of research laboratories.
- Funding and carrying out selected research in various fields of specialization of importance to scientific and economic development.

### **Suggestions at the university level:**

- Reconsidering the scientific research laboratories at the level of each university and maintaining the laboratories with the required and important specializations in order to reduce their number to ensure the provision of the requirements they need on the one hand and follow up their performance on the other hand.
- Linking the laboratory's continuity to its practical performance and the extent of its contribution to providing pioneering ideas and distinguished scientific research.

- Working to provide all the material and technical capabilities needed by laboratories, especially laboratories that supervise pioneering research projects.
- Choosing competent laboratory heads who practice pioneering thinking and seek to spread the pioneering culture.
- Granting faculty members grants to participate in international activities related to entrepreneurship and a requirement to submit a detailed report on the most important knowledge and skills acquired from them.
- Providing financial and moral stimulation for both faculty members and researchers who present innovative ideas and distinguished innovations.
- Encouraging the discovery of pioneering students and their inclusion in research teams.
- Forming a committee at the level of each university to conclude agreements and partnerships between laboratories and economic establishments.
- Establishing a clear mechanism explaining how faculty members or students who have pioneering ideas join the scientific research laboratories.
- Assigning scientific research laboratories to provide scientific and technical advisory services to economic units instead of the latter resorting to foreign companies to obtain knowledge, consultations, and patents.

**Suggestions at the level of scientific research laboratories :**

- Linking membership to specialization, experience and competence.
- Urging members to pay attention to the pioneering aspect.
- Encouraging active members who are specialized in entrepreneurship to join the research laboratories.
- Self-assessment of the performance of the scientific research laboratory and identifying and strengths and weaknesses and manipulating them.
- Carrying out research aimed at producing valuable results for practical application by economic units.
- Organizing courses and seminars to spread the entrepreneurial culture and instilling the spirit of entrepreneurship in the hearts of the members.
- Holding periodic meetings with students to spread the entrepreneurial culture, discuss their ideas, and facilitate the process of joining the distinguished among them to the laboratories.
- Relying on self-financing by marketing the results of its scientific research and innovations of its members to economic units.
- Hosting external experts and pioneers from the community to benefit from their expertise and advice.

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- Publishing research in global databases and registering patents therein.

### **Recommendations:**

- Scientific research is the starting point for countries' progress and development, and for this reason, scientific research laboratories in Algerian universities must play an active role in developing scientific research and joining the ranks of advanced universities.
- Making scientific research laboratories an incubator for innovations and creative ideas for faculty members and students.
- Focusing on quality, not quantity, so that the large number of research laboratories that burden the balance sheet must be abolished, and effective laboratories that provide added value to scientific research and economic development must be eliminated.
- Focusing on directing the outputs of scientific research laboratories in the research and leadership fields to economic units to benefit from them.
- Giving the opportunity to the pioneering faculty members and researchers in the Department of Scientific Research Laboratories.
- Making strategic leadership and its dimensions a strategic goal that scientific research laboratories seek to activate.

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