The Role of University Training in Developing Innovative High-Tech Projects at the University (Case Study: A Sample of Algerian Universities)

Taibi Ratiba[1], Maache Tayeb[2]

[1]Kasdi Merbah Univ. Ouargla (Algeria), taibi.rati@hotmail.fr

[2]Amar Tlidji Univ. Laghouat (Algeria), Social Empowerment and Sustainable Development Laboratory In the desert Environment, t.maache@lagh-univ.dz

Received: 10/2023, Published: 11/2023

Abstract:

The study aims to determine the role of university training in developing innovative high -tech projects, as an essential component in the university, and this was studied by doing a field study, where we designed a questionnaire that was applied to a sample of Algerian universities.

In order to achieve this, we tried to address the dimensions of the subject, starting with the conceptual framework of the study, by exposing the university training at the university, as well as innovative high-tech projects, finally, let us address the most important part of the study, which is the study of a sample of Algerian universities.

We analyse the collected data from the distributed questionnaire using statistical tools and tests such as correlation coefficient, Cronbach's Alpha, intermediate average and multiple comparison test using SPSS 22. The study concluded that the university training do contribute to the development and creation of innovative high-tech projects

Finally, the study found a statistically significant impact on university training in the development and creation of innovative projects with high-tech in the Algerian university.

Keywords: university training ; projects with high technological capability; University ;Algerian University.

Tob Regul Sci.™ 2023 ;9(2): 950 - 968
DOI: doi.org/10.18001/TRS.9.2.58

Introduction:

University formation is an urgent necessity today, and an inevitable passage for any developing or developed country that really wants to achieve economic development or maintain its level of development. The university has become one of the main effective indicators through which the growth and development of societies is measured. In Europe, for example, governments no

longer only recognize that universities are capable of helping the state in critical areas within international competition, but rather have taken effective steps to ensure that universities are better directed to do so, and therefore all universities must focus on science and technology, and this is The only way that will help it achieve the goals aimed, on the one hand, at promoting it to the ranks of industrial universities is through delivering its students and scientific products to global markets. To achieve these goals, the Algerian University must draw up new national policies for higher education at the university to ensure technological development and create high-tech products. This is what we will try to answer in this research paper, and therefore the problem of the study will be as follows: How can university training contribute to the development of innovative, high-technology projects at the university?

In order to answer this problem, we must address the following basic elements:

The first axis: concepts about the study.

The second axis: Introduction to the concept of high-technology.

The third axis: The contribution of university training to the development of high-tech innovative projects at the Algerian university.

The importance of the study: The importance of the study lies in the fact that it searches for the actual contribution made by university training, to the development of innovative projects, especially innovative projects with high technological capabilities.

Objectives of the study: The objectives of this study are mainly manifested in answering the problem of the study in the first place, which is mainly represented in identifying the impact of university training on the development of innovative projects with high technological capabilities. The study also aimed to link this to the field aspect, so that a sample of Algerian universities, and the knowledge of their researchers, respondents, about the extent to which they create and develop innovative, high-technology projects.

The first hypothesis: The determinant of university training affects the development and creation of innovative, high-technology projects at the university

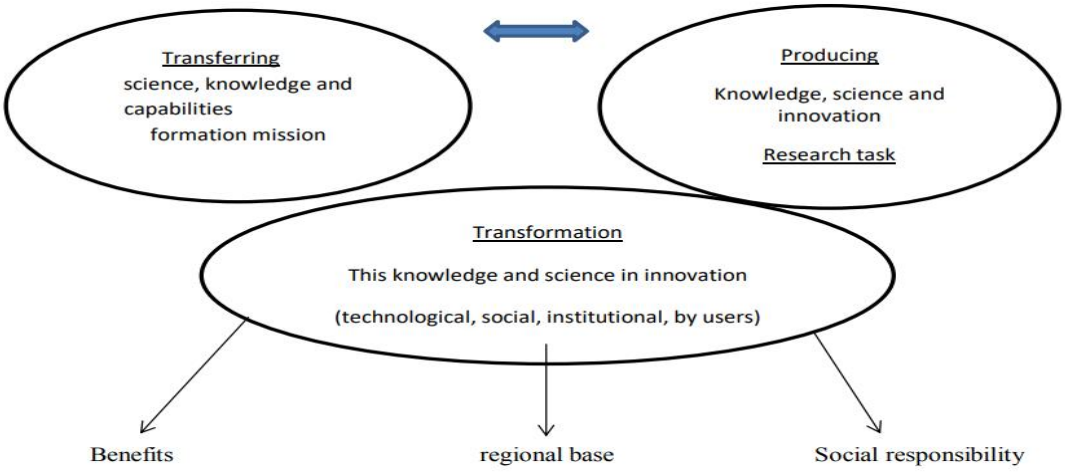
The second hypothesis: There are fundamental differences in the development and creation of innovative, high-technology projects at the Algerian university, due to personal variables and the interaction between them.

The first axis: concepts about the study.

A- Definition of the university

The word university means that it is (a group of schools) (groups d'écoles), or a group of institutes, or colleges that undertake the task of higher education[1]. The university is also defined as an independent scientific institution, with a specific organizational structure, systems, customs and certain academic traditions.[2] We also find three major functions of the university are;

Figure (1): The two "traditional" missions of the university and a third link to innovation



Source: Alain Storck, "The university rôle in innovation and the development territorial Forum Franco-Mexican

We notice from the previous figure that the university's tasks were not limited to the traditional tasks only of producing and transferring science, knowledge, research and training capabilities, but rather went beyond that with the link of innovation, to be able to transform all of the above into innovation that serves the technological aspect and the institutional and social aspect.

B- Definition of university training

University training constitutes one of the most important foundations and basic determinants that the university provides to its researchers, as it is a strategic requirement for the formation of qualified human capital, so it was necessary to develop it in order to produce innovative projects.

Ferry.G defines university formation as denoting a structured action that seeks to provoke a process, a reconstruction of varying degree, in the functioning of a person.

According to De Montomollin, training indicates an administrative change in the behavior of adults, in work of a professional nature. Both Otref G & Al agreed with him, and considered it a positive modification, with special directions, dealing with the individual's behavior in

performance, so that the required conditions are met for mastering work, meaning that training is a means to prepare qualified competencies for successful work.[3]

C- Definition of innovation

The concept of innovation falls within the creative development, so De Ramecourt & pons states, “Innovate today, you will live tomorrow.”[4]

Looking at the definition of innovation, we find that it was defined by the economist Joseph Alois Schumpeter (1883-1950) as implementing new combinations of means of production (launching new products, a new product method, or conquering a new market, a new source of raw materials, or a new organization)[5].

Innovation is also the application of new ideas that lead to significant improvement in products, production methods, organization and marketing within the organization in a way that aims to create a positive and successful impact on the performance and results of the organization[6].

The second axis: An introduction to the concept of high technology.

A- The concept of high technology institutions

Several definitions of high-technology institutions have been provided by several researchers. We will try to review the most important of them for successive time periods.[7]

One of the most important definitions presented in 1997 is the Jones-Evans definition, which defined it as “small and medium enterprises that have received an award of merit in the field of research and development from the government.” As Tesfaye defined it as “institutions established by individuals who have academic education and intensive research, so that the intensity of research and development refers to the proportion of resources diverted to research activities during the process of establishing an institution.”. Through the previous two definitions, we note that the researchers agreed that they are institutions that focus primarily on research and development activity.

In 2000, high-tech enterprises were defined by Markman, Baron et Balkin as "innovators who develop patents".

In the year 2001, several definitions were presented by a group of researchers for the concept of high-technology institutions, including the definition of Colombo and Delmastro, who agreed to consider it “institutions operating in the information technology sector (the Internet, software, and multimedia), and the production of technological equipment (equipment communication and electronic equipment). While Audretsch defined it as the “biotechnology sector” while Shane considered it as “the patents created”, Christensen, Ulhoi et Neergaard also defined it in the same year as “constituting the totality of the institutions of the information and communication

technology, life sciences and biotechnology sector", we note through all previous definitions that they have agreed to consider high-technology institutions as representing active institutions in the information technology and biotechnology sectors. This is due to the growth of the two sectors in the 2000s, especially in 2001, as they constitute two vital sectors that depend primarily on innovation and technology.

The definition of high-tech enterprises is evolving and growing with the development, so that in 2002 Gasse defined them briefly as the "contractor-researcher" concept, that is, it merged the field professional aspect, which is the entrepreneurship, as well as the scientific aspect, which is the (academic) research. In 2003, the researcher Autio presented a modern, brief and comprehensive concept for high-technology institutions, which is that it includes "entrepreneurship with high capabilities that are compatible with technological innovation," which is the comprehensive definition that considered that these institutions are the ones that adopt entrepreneurship with high capabilities that are inevitably linked to the employment of technological innovation. Thus, we can provide a comprehensive definition of high-tech enterprises as follows: It is the sum of the employment of each of, entrepreneurship, research, high potential and technological innovation.

B- The development of the establishment of high-technology institutions:

We can say that high-tech enterprises have always existed and in every era, where technological innovations were proposed by innovative and enterprising individuals, and this was the case during the Industrial Revolution in Great Britain in the seventeenth and eighteenth centuries. This was also the case in the United States of America in the nineteenth century. For example, maintaining the first institution created by Edison in the year 1878, which produced incandescent lamps. Here we are talking about (spin-off) the establishment of an institution by researchers at the Massachusetts Institute of Technology. In America, in the 1960s, research related to technological projects began to become more important, in 1984, for the first time, the frontiers of research on entrepreneurship and entrepreneurship included a section devoted entirely to high-technology enterprises at Babson College.

The origin of high-tech institutions is most of them created through (spin-off), that is, the establishment of an institution by researchers. This means that the majority of entrepreneurs are from the university or from academic research centers. From another perspective, the concept of entrepreneurship in business also includes institutions. Start-ups without direct support from an incubator because the employee - here the researcher - creates his work on the basis of the knowledge and skills acquired in the organization, and the entrepreneur usually finds a new product while working at the university, for example, or in an institution, and from there he exploits this new idea.[8]

C- Technological innovation

Technological innovation can be defined in a precise way as: a process that involves anything new that affects various types of production[9].

In 1986, J. Morin defined technological innovation as "the putting into effect or exploitation of an existing technology, which is carried out in new conditions and translated into an industrial result."[10].

Technological innovation is complete when it is introduced to the market (product innovation) or used in production methods (method innovation), through the intervention of all forms of scientific, technological, regulatory, financial and commercial activities[11]. This definition added that technological innovation is complete by introducing it to the market.

Jean Paul Flipo (2001) defines it as "a process whose outcome is uncertain but whose investigation is original, and which contains technological characteristics that create value in the product or process."[12]

Based on the above, we note that the term technological innovation consists of two parts, namely innovation and technology, meaning that it is every transformative application in technology that represents everything new that depends on equipment, tools, techniques, methods and rules, that leads to changes in the product, production methods as well as organization, and is completed by its introduction to the market.

The third axis: The contribution of university training to the development of high-tech innovative projects at the Algerian university.

- **First: the sample study and society**

The study population is represented by all university researchers within the walls of the Algerian University, within the technical and applied specializations, due to the presence of innovative projects with high technology in their scientific specializations. Also, due to the presence of innovative, high-tech projects in their scientific specializations, the number of researchers was obtained according to the data obtained from the General Directorate of Scientific Research and Technological Development - as shown in Table No. (1), which adopted the classification of the global scientific database SCOPUS in the distribution of scientific specializations.

Table No. (1): Study population

	Number of professors and researchers according to position						
Famous fields	Doc.	MAB	MAA	MCB	MCA	Pr.	Number of researchers
chemistry	1474	151	831	543	377	464	3840
Engineering sciences	7933	770	4400	2046	1601	1687	18437
Mathematical sciences and their interactions	575	191	842	347	332	243	2530
physics	594	55	323	220	167	233	1592
Nature and life sciences	2085	340	2361	644	735	859	7024
Result of researchers							33423

Source: Documents of the General Directorate of Scientific Research and Technological Development, 2018.

As for the study sample that represents the study population, we relied on Stephen Thompson's equation with an error rate of 5% (95% confidence interval), which showed that the appropriate sample size is 380 researchers out of 33,423 researchers, so that the study was conducted on a random sample from the study population. About 2,000 researchers were accredited from all Algerian universities in their scientific and technical specializations So that their electronic addresses were obtained by the General Directorate of Scientific Research and Technological Development (DGRSDT), on the basis of retrieving a sufficient sample for the study, and this was not done, as the retrieving process was useless, so that we faced the problem of lack of cooperation of the respondents, We responded to only 80 electronic questionnaires, which led us to use the paper questionnaire, which applied the previous standards in its distribution, and limited the universities of the south-eastern Algeria to the states of Ouargla, Laghouat, El Oued, Biskra and Ghardaia, in addition to the response of each of the universities of the states of Guelma and Mila, and it was The sample size was 440 individuals, distributed as shown in Table No. (2).

Table No. (2): Composition of the study sample members

	Distributed forms	returned forms	rejected forms	non-returned forms	Accepted forms
Electronic forms (all universities of the country	2000	119	00	1881	119
Ouergla	90	47	05	43	42
Laghouat	90	55	02	35	53
El-oud	90	21	05	69	16
Biskra	90	63	21	27	42
Gardaia	40	00	00	40	00
Galma	30	00	00	30	00
Mila	10	08	00	02	08
total	2440	313	33	2127	280

Source: Prepared by researchers.

A three-point Likert scale was also adopted to evaluate the responses of the sample members, where a number was given to each degree of the scale in order to facilitate the statistical processing process (Agree: 3, Neutral: 2, Disagree: 1). The weighted arithmetic mean for the triangular field was according to Table No. (3).

Table No. (3) Weights of the variables according to the three-way Likert scale - the weighted arithmetic mean of the three-way range –

Distance	The field
weak	From 1 to 1.66
middle	From 1.67 to 2.33
strong	From 2.34 to 3

Source: Ezz Abdel-Fattah, (2008), "Introduction to Descriptive and Inferential Statistics using spss", Saudi Arabia, 1st Edition, Khwarizm Scientific Library, pg.538.

- **Second: Data collection method**

In order to obtain the study data, the form was used according to each stage of the study:

Questionnaire (survey): In this study, we also used the survey method through a questionnaire to collect primary data. The questionnaire was designed and divided into two main sections, a section containing the personal data of the sample members in terms of (Gender, age, academic level, fields of scientific research, researcher's membership in a laboratory or research group within the university, researcher's membership in a laboratory or research group outside the university, number of high-technology research projects achieved by researchers); another section contains the independent variables, represented by university training. It consists of a set of statements that implicitly contain the dependent variable, represented by high-technology innovative projects.

- **Third: Data analysis methods**

The SPSS program (22) was used in the process of transcribing and statistical analysis of the data and testing the study hypotheses, as it included the following statistical methods:

- Correlation coefficient to test the validity of internal consistency.
- Cronbach's Alpha coefficient in order to test the stability of the study tool.
- Kolmogorov-Smirnov coefficient for the normal distribution test.
- Hypothetical average calculations to test the first, second and third hypotheses.
- Multiple variance test to test the fourth hypothesis.

- **Fourth: test the stability of the study tool**

Before proceeding with the analysis process and drawing conclusions, the validity and reliability of the statements included in the questionnaire was confirmed, so that the results would be credible and more realistic, as they were presented to a group of arbitrators with experience and specialization in various fields (Administration and Management Sciences, Applied and Technical Sciences, Psychology, Statistics), in order to identify the clarity of the expressions and determine the extent to which they belong to the axes of the study, and accordingly it was modified in its final form.

To determine the consistency and truthfulness of the questionnaire's statements, the Pearson correlation coefficient was calculated between the score of each statement with the total score for the axis to which it belongs, and the total score for the questionnaire using the 22SPSS program, as shown in Table No. (4) from which it is clear that the value of the correlation coefficient of each axis with the total score of the questionnaire is positive and statistically significant, which indicates that all axes of the questionnaire have a high degree of validity, and accordingly, the

results obtained show the validity and consistency of the statements of the axes of the study tool and their suitability for analysis.

Table No. (4): Structural consistency validity of the questionnaire axis

Axis No.	Axis	R correlation coefficient	Moral level	Indication
01	University training	0.88	0.00	Function

Source: Prepared by researchers based on the outputs of the 22spss program

To measure the reliability of the form, the Cronbach alpha test was used to measure the level of reliability, and its results were as shown in Table No. (5). It is noted from the previous table that the Cronbach's alpha value for the entire questionnaire is high (0.84), and this indicates that the questionnaire in all its axes has a high degree of reliability and can be relied upon in the study.

Table No. (5): Reliability coefficient (Cronbach's alpha coefficient) for the axis of the study instrument

the Cronbach alpha test	Axix	Number
0.75	University training	01
0.84	total	02

Source: Prepared by researchers based on the outputs of the 22spss program

To test the study hypotheses, we must first determine whether the data follows a normal distribution or not, by using the Kolmogorov-Smirnov test, according to Table No. (6). Which shows that the value of z equals (0.854) at a level of statistical significance equal to (0.460) is greater than $\alpha = 0.05$, and therefore it is statistically significant, and this means that the data follows a normal distribution.

Table No. (6): Kolmogorov-Smirnov normal distribution test

sample	SMA	standard deviation	Z Kolmogorov-Smirnov	Indication
280	56.30	10.45	0.854	.460

Source: Prepared by researchers based on the outputs of the 22spss program

- **Fifth: Sample characteristics**

Through the results obtained using the 22SPSS program and shown in Table No. (7)

Table No. (7): Characteristics of the study sample

Variable	Variable Categories	Frequency	Ratio
	Male	190	**67.9 %**
Gender	Female	90	**32.1 %**
	total	**280**	**100%**
	Less than 30 years old	78	27.9 %
Age	From 30 years to less than 40 years	91	32.5 %
	From 40 years to less than 50 years	38	13.6 %
	From 50 years and over	73	% 26.1
	Total	**280**	**100%**
	PhD researcher	142	% 50.7
Education level	Postdoctoral researcher	111	39.6 %
	other	27	9.6 %
	Total	**280**	**100%**
	Science and Technology	128	47.5 %

Fields of scientific research	Material Sciences	70	25.0 %
	Mathematics and computer science	16	05.7 %
	Nature and life sciences	66	23.6 %
	Total	**280**	**100%**
Member of a laboratory or research team within the university	Yes	243	% 86.8
	no	37	13.2 %
	Total	**280**	**100%**
Member of a laboratory or research team outside the university	Yes	74	26.4 %
	No	206	% 73.6
	Total	**280**	**100%**
Number of high-tech completed research projects	One project	149	53.2 %
	Two projects	45	16.1 %
	Three projects	13	4.6 %
	More than three projects	73	26.1 %
	Total	**280**	**100%**
Number of innovative high-tech projects	Without projects	190	67.9 %
	One project	61	21.8 %
	Two projects	16	5.7 %

completed	More than two projects	13	4.6 %
	Total	**280**	**100%**

Source: Prepared by researchers based on the outputs of the 22spss program

So, we determined the characteristics of the study sample as follows: Regarding the gender variable, we noted that the number of males in the study sample was 190 individuals out of a total of 280 individuals, representing a percentage of 67%, while as for the number of females, it was 90 individuals out of a total of 280 individuals, representing a percentage of 32%; As for the age groups, the highest group in the sample was the group from (30 years to less than 40 years) with a size of 91 individuals out of a total of 280 individuals, representing 32%, while the least represented group in the sample was the group (from 40). One year to less than 50 years) with a size of 38 individuals out of a group of 280 individuals, which represents 13%;

Regarding the educational level, the dominant category in the sample was the category (doctoral researcher), with a size of 142 items out of a total of 280 items, representing 50%. As for the least represented category in the sample, they were the other categories (such as master's and master's degrees, for example), with a size of 27 items out of a total of 280 item. That represents a percentage of 9%. As for the fields of scientific research, the dominant category in the sample was the category (science and technology), with its various scientific specializations, with a sample size of 128 individuals out of a total of 280 individuals, representing a percentage of 47%. The least represented category is the field of (mathematics and computer science), with a size of 16 items out of a total of 280 items, representing 5%. With regard to the membership of researchers in a laboratory or research group within the university, the number of individuals who joined constituted 243 individuals out of a total of 280 individuals, which represents a percentage of 86%. As for the unorganized individuals in the sample, their number constituted 37 individuals out of a total of 280 individuals. This represents a percentage of 13%. As for the researcher's membership in a laboratory or research group outside the university, the number of unorganized individuals constituted the largest number, amounting to 206 individuals out of a total of 280 individuals, which represents a percentage of 73%. As for the number of organized individuals, they constituted 74. Individuals out of a total of 280 individuals representing 26%;

Regarding the number of high-tech research projects completed by them, the highest category in the sample was the (one project) category, with a size of 149 items out of a total of 280 items, representing 53%, while the least represented category in the sample was the (three projects) category, with a size of 13 unit out of a total of 280 units representing a percentage of 4%. As for the number of innovative, high-tech projects completed, the dominant category was the category (without a project), with a size of 190 units out of a total of 280 units, representing a percentage

of 67%. As for the least represented category in The sample is a category (more than two projects) with a size of 13 items out of a total of 280 items, representing 4%.

- **Sixth: Presentation and testing of the study results**

The results of the study were presented and tested using the hypothesized mean method as well as the multiple variance method

- **Regarding the first hypothesis:**

H0: There is no statistically significant effect of university training on the development and establishment of innovative, high-technology projects at the Algerian university at a significance level of 5%.

H1: There is a statistically significant effect of university training on the development and establishment of innovative, high-technology projects at the Algerian university at a significance level of 5%.

To test this hypothesis, the hypothesized mean method and the one-sample t-test were used, as shown in the following table. So the hypothetical average represents the number of statements at the lowest value plus the number of statements at the highest value, all divided by 2.

So ; 12=2/24 =3×6 + 1×6

Table No. (8): Testing the first sub-hypothesis.

variables	sample	Hypothetical mean	SMA	Standard deviation	Value of « t »	Indicative level	Significance level	indication
F-1-	208	12	12.70	2.96	3.95	0.000	0.05	Statistically significant

Source: Prepared by researchers based on the outputs of the 22spss program

It is noted from Table No. (8) that the "t" value for one sample (t=3.95) is statistically significant, because the calculated significance value is equal to (0.000), which is smaller than our approved significance level (0.05). This means that there are statistically significant differences between the hypothetical mean is (12) and the arithmetic mean is (12.70) f the effect of university training in developing innovative projects with high technology, and the differences are in favor of the arithmetic mean. This indicates that there is a statistically significant effect of

the determinant of university training in developing and establishing High-tech innovative projects.

Therefore, we note that the probability value Sig is less than or equal to the value of α.

Where: ≤ 0.05 (Sig = 0.000), and therefore we reject H0 and accept the alternative hypothesis H1.

So: There is a statistically significant effect of university training on the development and establishment of innovative, high-technology projects at the Algerian university at a significance level of 5%.

- **Regarding the second hypothesis:**

H0: There are no fundamental differences according to university training in the development and creation of innovative, high-technology projects at the Algerian university due to personal variables at a significance level of 5%?

H1: There are fundamental differences according to university training in the development and creation of innovative, high-technology projects at the Algerian university due to personal variables at a significance level of 5%?

To test this hypothesis, the multiple analysis of variance method was used, as shown in Table (9).

Table No. (9): Testing the second hypothesis

Variables	Sum of squares	Degree of freedom	Mean squares	Values of 't'	Sig	Statistical significance
Sex	8.901	49	0.182	0.181	0.822	Not a sign
Age	80.913	49	1.651	1.324	0.090	Not a sign
Educational level	26.525	49	0.541	1.307	0.100	Not a sign
Fields of scientific research	90.240	49	1.841	1.339	0.081	Not a sign
Member of a laboratory or research team within the	5.547	49	0.113	0.980	0.517	Not a sign

university						
Member of a laboratory or research team outside the university	9.892	49	0.202	1.042	0.407	Not a sign
Number of high-tech research projects completed	59.323	49	1.211	0.706	0.927	Not a sign
Number of innovative high-tech projects completed	27.415	49	0.559	0.845	0.757	Not a sign

Source: Prepared by researchers based on the outputs of the 22spss program

According to Table (9), we noticed that the mean squares for the gender variable was (0.182) with one degree of freedom (49), while the mean squares for the age variable was (1.324) with a degree of freedom (49), and the mean squares for the educational level variable was (1.307).) with a degree of freedom (49), while the mean squares for the scientific research principles variable reached (1.339) with a degree of freedom (49), the mean squares for the variable member of a laboratory or research team inside the university was (0.980) with one degree of freedom (49), and the mean squares for the variable member of a laboratory or research team outside the university was (1.042) with one degree of freedom (49), while the mean squares for the variable was (1.042) with one degree of freedom (49). The number of high-tech research projects completed (0.706) with a degree of freedom (49), While the mean squares for the variable number of innovative high-tech projects completed reached (0.845) with a degree of freedom (49), the statistical significance came from the (f) values for the status of gender, age, educational level, fields of scientific research, member of a laboratory or research team within the university, member of a laboratory or A research team outside the university, the number of high-tech research projects completed, the number of innovative high-tech projects completed, and the interaction between them, respectively, are as follows: (0.181, 1.324, 1.307, 1.339, 0.980, 1.042, 0.706, 0.845), all of which are not significant at the significance level of 0.05, and therefore we say that there are no fundamental differences for the development and establishment

of innovative, high-technology projects at the Algerian university due to personal variables at the level of significance 5%.

We note that all probability values Sig are greater than or equal to α.

Where: ≥ 0.05 (Sig = 0.000), and therefore we reject H1 and accept the alternative hypothesis H0.

So: There are no fundamental differences according to university training in the development and creation of innovative, high-technology projects at the Algerian university due to personal variables at the 5% level of significance.

- **Seventh: Discussing the results of the study**

The results of the field study indicated that:

- The Algerian University is interested in developing and creating innovative high-tech projects and this is through paying attention to the researcher's communication with the supervisor or other supervisors, within the framework of university training (the arithmetic mean of the answers to the twenty-sixth statement = 2.56 and its rank is 3 out of 27 statements in the questionnaire). This indicates the importance that the Algerian University attaches to providing professors to ensure the continuous training of researchers, especially when it comes to the role of the supervising professor and his supervision of all scientific work.
- The results indicated that the Algerian university is interested in developing and creating innovative projects with high technology, and this is through paying attention to school standards, within the framework of university training (the arithmetic mean of the answers to the twenty-third statement = 2.21 and its rank is 7 out of 27 statements in the questionnaire). This demonstrates the Algerian University's keenness to improve university training and ensure its continuous modernization, and we see this clearly through its reliance on new and advanced training systems such as its adoption of the (LMD) system, which keeps pace with European countries.
- The results indicated that the Algerian university is not interested in developing and creating innovative, high-tech projects through applications and software available at its level, within the framework of university training (the arithmetic mean of the answers to the twenty-second statement = 1.88 and its rank is 21st out of 27 statements in the questionnaire). We find that its lack of availability hinders the researcher in using scientific experiments, especially technical and applied ones, and this is what stands in the way of his scientific innovations, especially high-tech innovations.
- It should be noted that there is a statistically significant effect of university training on the development and establishment of innovative, high-technology projects at the Algerian university. This is the answer to the main problem of the study.

- As for the development and establishment of innovative, high-technology projects at the Algerian University due to the personal data variable; it was found that there are no fundamental differences.

Conclusion

The university formation at the Algerian University has witnessed remarkable change and development since independence until today. The Ministry of Higher Education and Scientific Research tried to establish several laws to attract scientific researchers by granting the Algerian university the role it deserves towards the country and abroad, but it was not sufficient, and rather constituted an obstacle towards that.

Through our analysis of the issue of the contribution of university training to the development of innovative, high-tech projects, we have reached the need to pay more attention to updating the university training programs followed by the Ministry responsible for the Algerian University on an ongoing basis, in order to stimulate and encourage university researchers to produce, create and evaluate scientific projects in general, and technological projects especially with high technological capability.

We concluded that university training in Algerian universities constitutes an effective element in the development of high-technology innovative projects, so that the main result was the presence of a statistically significant effect of university training in the development and establishment of high-technology innovative projects in Algerian universities. We also concluded a set of results, the most important of which are:

1. Algerian universities are generally interested in university training, as the most important area of interest in it is related to the researcher's communication with his supervising professor or other professors as supportive components for him, or what is related to the university's interest in school standards, despite the lack of applications and software that support the researcher in developing innovative projects with high tech.
2. There is a statistically significant effect of university training on the development of innovative, high-technology projects at the 5% significance level.
3. There are no fundamental differences for university training in the development and creation of innovative, high-technology projects at the Algerian university due to personal variables at a significance level of 5%.

❖ From the above, some recommendations can be directed to officials in the higher education sector in general and the university in particular, who can benefit from them, namely:

1. Algerian universities must modernize and develop university training curricula and programs within them, by adopting teaching standards of a high level and quality, as well as

providing various advanced applications and software that help the emerging researcher develop his innovative, high-tech project.

2. The need to emulate the foreign experience in activating links between universities and their external environment, by establishing multiple linkages, such as adopting university incubators, especially technological incubators, technology transfer centers in universities, patent offices in universities, and signing industrial agreements, while activating the real role of the national system for innovation .

Referrals and references:

[1] Etienne Gillon and others, **"petit la rousse",** (paris: SNF edition, 1972) .p.957.

[2] Zarzar Al-Ayashi, Sofiane Bouatit, **"University and Scientific Research for Development: A Reference to the Algerian Case,"** Arab Future Magazine, Issue 396, 2012, p.111.

[3] , Al-Tayeb Balouli, **"A Study of Research and Development Activities on Innovation in Industrial Institutions - A Case of a Sample of Institutions in Algeria -",** (third-year doctoral dissertation: unpublished, Department of Management Sciences, Faculty of Economic Sciences, Commercial Sciences and Management Sciences, Kasdi Merbah University - Ouargla, 2016), pp. 75-76.

[4] N'Doli Guilloume ASSIELOU**, "Evaluation of innovation processes",** (PhD thesis, University of NANCY, INAPL defended on 10/12/2008), P.14.

[5] Blandine LAPERCHE**, "innovation orchestrated risk and organization",** (France: l'harmattan, unpublished, September 2003).p.7.

[6] Bin Nadhir Nasr al-Din, **"Creativity and its Role in Enhancing the Competitiveness of Business Organizations,"** Journal of Economic Research, No. 4, University of Blida, 2010, p. 227.

[7] Candido Vieira Borges Jr, and other, "**The creation of high technology companies (EHT) Examination of the documentation"**, the series of research notebooks of the Chair of entrepreneurship, ISSN: 0840-853X, HEC Montréal July 2003, p .5.

[8] Ibid, pp.3-6.

[9] OUKILM-said, **"Economy and management of technological innovation – research and development**", (Algiers: office of university publications, without edition, 1995), p.17.

[10] Bouquet Valérie, **"strategic monitoring system at the service of research and innovation in the company: principles - tools - applications**", doctoral thesis (unpublished), University of Law of Economics and Sciences of 'aix, marseille 3, 1995, p.56.

[11] Al-Jawzi Jamila, "**The Role of Technological Innovation in Enhancing the Competitiveness of Arab Countries**," Journal of Economic and Management Sciences, Issue 11, 2011, pg.276.

[12] Jean Paul Flipo, "**Innovation in service activities, a process to be rationalized**", edition of organization, Paris, France, 2001, p.17.