

The role of digital business incubators in developing the Algerian economy

Received date: 03/10/2023 Accepted date:02/10/2024 Published date:31/10/2024

Lotfi Ali Guechi ¹

¹University of Constantine 3, Algeria,
Email: lotfi.aliguechi@univ-constantine3.dz

Abstract:

Business incubators have become one of the important mechanisms in today's world, through which countries and economies can contribute to eliminating several problems, especially economic and social problems, such as unemployment, and enable sustainable development.

Incubators are defined as a coordination process as if it were a mechanism similar to medical incubators for children, through which mechanisms and support services are provided within a period of time until the rehabilitation process takes place and the production process and actual work begins.

Keywords: Business incubator - small and medium enterprises - development - university outputs - economic environment-creativity and innovation.

Corresponding Author: Ali Guechi Lotfi, Email: lotfi.aliguechi@univ-constantine3.dz

1. INTRODUCTION

Attempts to raise the level of scientific research are among the major challenges that countries seek at the present time, due to their importance, by mobilizing national scientific and technical capabilities and directing them to support the process of sustainable development and establish a culture of comprehensive future outlook through which countries can face the challenges of the twenty-first century, whose basic features seemed to be reflected in the growing role of science, technology and innovation as a basic determinant of comparative advantage, and as a necessary means to create new job opportunities and achieve economic gains, in light of the increasing intensity of competition, domestically and internationally, the relative importance of traditional natural resources is declining.

The trend in strengthening and strengthening the scientific research, development and innovation system is important in that it aims to raise the level of national scientific and technical capabilities, and to achieve the optimal investment of available resources in order to enable rapid utilization of the opportunities offered by the new rapidly changing global economy, and compete with its products and services successfully in global markets, while working to provide the capabilities and the appropriate environment for the acquisition, dissemination and improvement of foreign technology, and the development of local technologies, especially in vital and strategic fields.

Whatever the causes of Arab backwardness and the factors that entrench it, staying outside the circle of scientific development and scientific research comes at the forefront of these reasons.



The situation related to the absence of scientific research may have been acceptable when the Arab world was in peaceful isolation living on the ruins of what remained of the knowledge achieved by Arab scientists and researchers in the eras of progress and prosperity, but after the establishment of universities and their proliferation in each country, staying outside the fields of scientific research in all its theoretical and applied dimensions is deplorable and shameful.

Perhaps we do not want here to flip the dilemmas of the reality of scientific research in our Arab world, as much as we want to address one of the effective mechanisms that we see as one of the most important strategic tools that are very reliable in embracing creators and innovators from university graduates, which is mainly represented in "business incubators", because of their active role in investing these outputs within the economic environment.

In this paper, we may address the study of this topic by asking the following basic question:

What is the role of "business incubators" in eliminating unemployment by attracting university graduates?

This problematic will be addressed by talking about three main pillars, the first of which deals with the reality of scientific research in the Arab world, while in the second point we will talk about business incubators in general, and finally we will try to link business incubators with scientific research by explaining the strategic role they play in order to invest the university's outputs and provide jobs for graduates.

2. CONCEPTS ABOUT SCIENTIFIC RESEARCH:

Before discussing business incubators and their strategic role, we will try to address the meanings of scientific research by explaining its importance and the Arab reality in which we live in this field.

1) Definitions:

- **Digital Business** : refers to the use of digital technology and tools to drive and support business operations, processes, and strategies. It involves leveraging digital innovations such as cloud computing, data analytics, mobile apps, social media, and the Internet of things to enhance customer experiences, optimize internal operations, and create new revenue streams. Digital business models often focus on creating value through digital products, services, and platforms that deliver real-time, personalized, and seamless experiences to customers. This approach allows businesses to adapt quickly to changing market conditions, improve efficiency and agility, and stay ahead of competitors in today's fast-paced, digital-first economy.⁽¹⁾

- **Incubator**: Business incubators emerged in 1959, due to a major shift in regional economic development strategy and the dynamic changes in the social environment. However, major development of BIs has taken place in two waves. The first period took place in the 1980s and the 90s, when incubators were recognised as local economic development tools. The second wave followed in 2000 until present, and is mainly concerned with the growth and diversification of the incubators.⁽²⁾

- **Algerian Economy** : Ranked as the third most important economy in the MENA region and a leader in the Maghreb, Algeria is one of a handful of countries that have achieved 20%

poverty reduction in the past two decades. The Algerian Government took significant steps to improve the wellbeing of its people by implementing social policies in line with the United Nations Sustainable Development Goals. Among other major achievements, the country's oil boom has enabled the authorities to clear Algeria's debt, invest in infrastructure projects and improve the country's Human Development Indicators.

Algeria has made significant gains in each of the key Human Development Indicators (HDI). The country's position is now 83rd out of 188 countries, which ranks it among the highly developed cohort in the latest Human Development Report.⁽³⁾

The still largely positive results of shared prosperity have contributed to Algeria's overall socioeconomic stability. However, the continued depressed worldwide oil prices have necessitated changes in country economic models and have triggered a domino effect of reforms in the MENA oil exporting countries to adapt to the new scenario.

On the economic front, Algeria's economic growth decelerated in 2017 due to a slight decline in hydrocarbon production and continued modest non-hydrocarbon growth, showing a slight upturn from 2.3 % in 2016 to 2.5 % in 2017.

Ammar Bouhouche and his colleague define scientific research as: "that accurate organized investigation and investigation aimed at revealing the facts of things and their relationship with each other, in order to develop or modify the reality actually practiced for them" ⁽⁴⁾.

Maurice Angers defines it as a scientific activity that relies on the

process of collecting and analysing data to answer a specific research problem.⁽⁵⁾

Hillway defines it also as a method of study through which a solution to the problem can be found through careful and thorough investigation of all clear evidence potentially relevant to the specific problem.⁽⁶⁾

Through the previous definitions, we can say that scientific research is a **purposeful and organized activity that seeks to study phenomena scientifically in order to remove ambiguity, interpretation, control, direct and harness them in a way that serves and contributes to the development of society and satisfying human needs and desires.**

In general, we can divide Research & Development activities into three basic categories: ⁽⁷⁾

A. Basic research: It is research aimed at achieving progress in a particular area of knowledge and on a specific topic and without expecting commercial applications of such research in the near future, i.e. theoretical research.

B. Applied Research: It is research carried out with the aim of achieving practical applications, and seeks to achieve commercial objectives.

C. Development activities: These activities transform the results of applied research into useful commercial applications, and they

aim to develop and improve the applications of research results.

2) The importance of scientific research:

No one questions the importance of scientific research and its role in the renaissance of peoples and nations and facing the challenges they face at all levels, as it has become the main means of achieving development and solving the problems of society, and we can see this importance through the following facts:

- ✓ It helps a person maintain his health and safety such as finding medicines for deadly diseases and epidemics.
- ✓ It helps to provide comfortable conditions for humans and reduce costs, especially muscular effort, and helps to create better living conditions such as the invention of transportation, travel and others.
- ✓ Helps to gain effort, time, increase production, and productivity through cutting-edge inventions in the fields of industry.
- ✓ Helps to understand, interpret, control and benefit from phenomena.
- ✓ Helps increase the economic power of countries through its direct contribution to increasing production, improving its quality, and creating a competitive advantage for the institutions and economies of these countries.

- ✓ Helps to avoid risks that may be exposed to humans, such as dangers resulting from some phenomena such as hurricanes and earthquakes.
- ✓ Helps countries develop their military capabilities to defend themselves and deter their enemies.
- ✓ Helps solve problems facing society and hindering its progress, such as the problem of unemployment, crime and poverty.

Scientific research is the pivotal factor in advancing the progress of societies regardless of the degree of their development and progress, as it is the tool that provides them with facts about the lived reality in order to rely on them in drawing up projects and completing plans⁽⁸⁾.

It is also considered the main means of achieving the integrated development of society, as "scientific research constitutes a non-material investment, which achieves its long-term return, leads to increased economic growth and enables institutions to meet the challenges of competitive environments"⁽⁹⁾, where "experience shows that no State can achieve economic and social development without the presence of researchers, engineers and specialists who take upon themselves the responsibility of carrying out the basic and applied research needed by the State".⁽¹⁰⁾

It has become clear that it is not possible to solve the problems of society, develop it, achieve its ambitions and hopes, control its

future and challenge its conditions - especially in light of the intertwined and accelerated national and international changes - without relying on scientific research, which is the way to address problems and develop societies, and the progress of nations has become linked to scientific research and the extent of their control over technology.

Given this importance, developed countries have long been investing in scientific research because they have directly touched its benefits and advantages, while developing and Arab countries have remained far from achieving this endeavour.

3) Scientific research in the Arab world (characteristics and data):

The contemplator of the reality of scientific research in our Arab world will find that it is characterized by several characteristics, perhaps the most important of which are:

A. Lack of clear strategies and effective policies :

Scientific research in the Arab world suffers from the absence of clear and well-defined strategies and visions for scientific research, its objectives and functions, so the establishment of research centers and other bodies is often a mere imitation of what exists in developed countries, without carrying out actual studies.

B. Double the volume of spending on scientific research:

The follower of Arab spending on scientific research notes that it is in decline, as the percentage of this expenditure in 1970 amounted to 0.31% of the gross national product, and in 1980, it reached 0.27%, rose in 1990 to reach 0.67%, and then declined in 2004 to reach 0.30%, which is less than what was spent in 1970. These percentages are very low compared to the 4.70% of GDP spent by Israel alone in 2004.

C. Non-contribution of the private sector in funding scientific research:

In addition to the previous point, the funding of research activities in the Arab world depends mainly on the government alone in front of the weakness or absence of the private sector's contribution to this, as government funding amounted to about 80% of the total funding allocated to research and development, compared to 3% for the private sector and from various sources, unlike funding in developed countries, where the share of the private sector in funding scientific research is estimated at 70% in Japan and 52% in Israel and the United States of America.⁽¹¹⁾

The reason for this may be due to the absence of a culture of investment in scientific research, and the immaturity of the idea of a market economy in the Arab countries, as industries are still protected by the state, and institutions do not take into account the requirements of competition and achieving competitive advantage, which scientific research and investment in it is one of the

important ways to achieve.

D. Non-contribution of scientific research to the development process and solving society's problems:

Scientific research in the Arab world has not achieved its aims, which are mainly represented in the development of society and solving its problems, and the reason for this can be explained by the excellence of scientific research in the Arab world of an academic nature, and this is what made it move away from achieving the aspirations and development of society, in addition to the absence of an interactive and correlational relationship between research bodies and the rest of the community institutions, especially productive ones ⁽¹²⁾, as well as the lack of interest in business incubators as a mechanism to activate scientific research and link research bodies to the economic sector and society, this Besides, problem tackling is always far from research centers.

The reasons for this situation may be due to the lack of benefit from the results of research, as one researcher points out that "research carried out in research centers in the Arab world is considered directed and is not allowed to be published by the researcher, and does not find its way towards the productive sectors, and is neglected and does not see the light." ⁽¹³⁾

In addition to the above, there is no clear strategy in the field of

scientific research on the one hand, and its failure to link it to the general strategy for development on the other hand, and this is what made development efforts move in one direction and research and development efforts go in another direction without coordination or integration between them, and this is what led to the failure of development policies and research and development policies in the Arab world.

E. Lack of interest in researchers and improving their material and social conditions:

Where the researcher in the Arab world suffers from the deterioration of his social status due to his low salary and the material rewards granted to him, and this has negatively affected his return and research production, as we find, for example, that some researchers, especially university professors, resort to teaching overtime or to practicing parallel activities and then do not devote themselves entirely to scientific research activities.

This situation has affected the inability of researchers to participate in scientific forums, whether inside or outside their countries, and it is considered the direct cause of the migration of many of them to developed countries, and this is confirmed by the Arab Human Development Report for the year 2002, which indicated that there is a weakness in the incentives and competencies provided to researchers and workers in the field of research and development, which pushes their migration to other

places.⁽¹⁴⁾

What is noticeable in general is that the Arab world lacks the appropriate climate that encourages and stimulates scientific research and the investment of its results in Prosperity and development.

3. WHAT ARE BUSINESS INCUBATORS?

1. Historical reading of business incubators:

The incubators began in 1959 in the United States of America. They first emerged from the so-called "Batavia Industry Center", followed by many countries of the world, particularly those of the European Union, which benefited from the experience and established the first business incubator in Europe in 1986.

Egypt was the first Arab country to establish a technology incubator under the Ministry of Industry in 1998. Statistics indicate that there are currently 1,000 technology incubators in the world, of which approximately 500 are in the United States of America alone.

In the eighties and early nineties of the last century, incubators became the appropriate societal tool to achieve economic development by helping small business organizations grow and continue, as a key and important factor for economic growth in the region in which they originated. Since then, local economic development agencies, government and private institutions have

embraced incubators as a tool to reduce the likelihood of failure, as well as to accelerate business innovation.

But what the world witnessed in the second half of the nineties, which is known as the information technology revolution, and what that revolution contributed to the change in the basic rules prevailing in the markets and in the incubator industry, represented by the speed of access to the market and survival in it, was the main factor for the success of incubators in the Internet age, so joint ventures arose, capital readiness increased and many events emerged that necessitated the need for management more than the need for the technical side and expertise. These market changes necessitated a revival and then a redefinition of incubators.

Table (01): Main characteristics of business incubator models in the eighties and nineties of the twentieth century

Incubators in the nineties	Incubators in the eighties
Private property	Public or semi-public domain
Non-profit	Non-profit
Business Orientation	Orientation towards society
Ownership for service	Fees for Service Purposes

purposes	
Aims to reduce time-to-market	Aims to reduce business costs
Tight focus, particularly on information technology	Its uses are varied

Source: Gonzalez, Marisela & Lucea, Rafael, 2010,

Fig.1. the Evolution of Business Incubation, Working Paper, March, P. 1.

Besides the above two temporal phases (1980s and 1990s), some point out that, starting in 1998, business incubators are a fundamental turning point that reflects the transition towards labor in a globalized world.

Some call this stage third-generation incubator, as the shift has been made to the establishment of for-profit incubators, taking advantage of developments in the field of information and communication to provide support that contributed to the creation of a new type of incubators known as knowledge-based projects.

1-Definition of business incubators:

Business incubators are defined as: "an integrated package of services, facilities, support and consultation mechanisms provided for a specific period of time by an existing institution with its experience and relationships for entrepreneurs who wish to start a

small enterprise in order to reduce the burden of the start-up phase".

It is also defined as "the successful development of companies and projects through a set of actions to support resources and services, provided and coordinated by the incubator management, and offered through its network of contacts".⁽¹⁵⁾

The Arab Human Development Report 2003 describes it as "a new type of structure supporting the innovative activities of SMEs or entrepreneurial creative developers who lack the necessary capabilities to develop and commercialize their innovative research and technologies".⁽¹⁶⁾

Among those who define it as coordination processes and those who describe it as a mechanism similar to medical incubators, in which newborns are placed undeveloped, as well as those who prepare it as an integrated package of services and support mechanisms that are provided during a period or periods of time until the rehabilitation process takes place and the production process and actual work begins.

We can highlight the summary of what has been reached by researchers about the classifications of incubators through the following table:

Table No. (02): Multiple classifications of incubators

Target	Title	N°
First. By Target		
Attracting foreign capital.	Initial	1
Investing human energies or a specific segment of society.	Regional	2
Exchange facilities and focus on technical support and knowledge.	Industrial Area	3
Serving a specialized sector such as software and engineering industries.	Specialized Sector	4
Advanced design service for new non-traditional products with advanced devices.	Technology	5
Develop academic research and ideas.	Research	6
Serving different sectors by adopting the information network.	Virtualization	7
Helping startups in the field of Internet and software.	Internet	8

Target			Title	N°
Examples	Concerned Party	Technology level	Title	N°
Second. By nature of the field				
- Cambridge Incubator - Campsix Idealab & Companies	Projects with knowledge and information. Distinctive craft industries	Simple technology in service delivery or light manufacturing	Public or mixed projects incubator	1
- Mackansej	Operating Projects Industry Restructuring Projects	Diverse technology related to the country	Economic Development Incubators (Specialized)	2
-Anderson Consulting - The	Research Centers Universities	Advanced Technology	Technology Incubators	3



Target			Title	N°
Elevator Com. - Internet Capital Group	Information Centers			
Third. According to the services provided				
Comprehensive services (infrastructure, communication technologies, human resources, capital).			Project Incubator	1
Accelerate the process of starting or operating any new business project (consulting services, obtaining financing, launching the project as soon as possible).			Project Accelerators	2
Establishing contractor and consultant networks as well as investors.			Project Entrances	3
Investing in an early period of work, taking initial measures commensurate with the general strategy, and then building mini-cooperatives distributed among their members to provide real support for the value of investments.			Project Networks	4

Source: Prepared by the authors of the paper, based on:

Gonzalez, Marisela & Lucea, Rafael, (2001),

Fig.2. the Evolution of Business Incubation, Working Paper, March.

We can define a business incubator as an enterprise that works to ensure the success of small enterprises by providing an appropriate working environment.

The importance of business incubators:

We can discern the importance of business incubators through their expected strategic roles, the most important of which we try to summarize in the following points ⁽¹⁷⁾:

- Provides scientific advice and feasibility studies for emerging SMEs.
- Linking emerging and innovative projects with productive sectors and market dynamics and requirements.
- Encourages non-traditional and venture investors to set up their own companies which are described as venture capital or venture capital firms.
- Contribute to the employment of scientific research results, innovations and creations in the form of projects that make them transferable to production.
- It provides job opportunities for those wishing to be real businessmen, especially university graduates, and helps them to

start properly and overcome the rough roads at the beginning of their lives, perhaps the most prominent of which is the bureaucracy that is reflected in (loans, guarantees, establishment mechanisms, etc.).

- It works to establish and support small or medium production or service projects based on the application of appropriate technologies and modern innovations.

- Qualifies a generation of business owners and supports them to establish serious and profitable businesses, which contributes to the development of production, opening job opportunities and advancing the economy.

- Helps small and medium enterprises to face the administrative, financial, technical and marketing difficulties that usually face the establishment stage.

- Provide support and assistance to small and medium enterprises to achieve high growth rates and quality.

- Opens the way for investment in areas of feasibility for the national economy such as technological business incubators, micro-industry incubators, supporters, incubators of information projects, and others.

4- THE ROLE OF BUSINESS INCUBATORS IN INVESTING THE OUTPUTS OF SCIENTIFIC RESEARCH:

1- Business incubators and scientific research (relationship and interdependence):

There are very weak links between R&D institutes and production (post-production) sectors and human resource development (pre-production) programs, making R&D efforts fruitless and often inadequate, as R&D institutes are run like academic institutions rather than industrial enterprises, and support for industry is very low. Since R&D institutes are the source of knowledge for modern industry, they remain incapable of fulfilling their mission ⁽¹⁸⁾.

This has made business incubators the ideal tool to solve the problems of scientific research centers and researchers and translate their work into productive reality, as well as a strategic tool for building and preserving intellectual capital, and reducing as much as possible its migration.

2- The role of business incubators in accommodating and accompanying intellectual production owners:

It is no secret to anyone the role that incubators can play in absorbing research competencies and stopping the brain drain in the Arab world abroad, which leads to material losses and missed opportunities for Arab countries to advance scientific research and achieve the desired development.

3- University and Business Incubators :

Business incubators associated with the university (or the so-called

university business incubators) have been established in order to create a new and sensitive role for them that contributes to economic development, in addition to the traditional roles of the university (higher education, scientific research,), the university may provide investment and operational opportunities for its final outputs, especially scientific research through this type of incubators.

The aim of this type is to "adopt" creators and innovators and transform their ideas and projects from a mere laboratory model to production and investment, by providing services, support and practical assistance to innovators in order to obtain the product that creates added value in the market economy, through ⁽¹⁹⁾:

- ✓ Embracing creative and distinguished ideas for young men and women.
- ✓ Generate job opportunities for young men and women.
- ✓ Contribute to providing continuous opportunities for self-development.
- ✓ Contribute to the creation of the information knowledge society.
- ✓ Eliminate the causes of brain drain.
- ✓ Ensure effective utilization of creative human resources.
- ✓ Marketing innovative scientific and technical outputs.

1- Incubators and the "intellectual production" system:

In the era of globalization and the transition from an industrial economy to a knowledge economy, intellectual products have become a major role in any process of building a sustainable development strategy, as intellectual capital is one of the main productive factors, and in this context, the famous management scientist "**Peter Drucker**" points out that knowledge has now become one of the factors of production, just like capital and labor⁽²⁰⁾.

The importance of information as commodities and knowledge as an essential element of production, along with labour and capital, has increased and continues to become the driving force of national and global economic development.

The knowledge economy or knowledge-based economy is defined as "the economy based on the production, distribution and use of knowledge and information", and the British Ministry of Industry and Trade (1998) defines the knowledge economy as "the knowledge-driven economy, based on the generation and exploitation of knowledge, as the prevailing knowledge plays an important role in the creation of wealth"⁽²¹⁾.

In fact, it has been argued that sustainable competitive advantage is continuous innovation, and incubators of all kinds are a sine qua non in the Internet revolution, to start successful projects, and it was seen as one of the many ways to leverage

available knowledge in order to provide the opportunity to accelerate innovation processes ⁽²²⁾.

We also see that **"research generates knowledge, knowledge creates innovation, innovation grows and growth in turn creates wealth"** ⁽²³⁾.

5-CONCLUSION:

The reality of scientific research in the Arab world is still far from the desired level, especially in terms of activating its role in the development process and encouraging investment, and this can only be achieved through the adoption of the method of using "business incubators" as an important means in applying the results of scientific research, establishing investment projects, as well as reducing talent unemployment and brain drain abroad and thus achieving sustainable development.

Through this modest research paper, we can summarize the role of "business incubators" as an effective tool and an important mechanism for investing the outputs of scientific research in the economic environment and developing it for the benefit of the country (Algeria), as follows:

➤ Startup Ecosystem Development

1. Over the past five years, DBIs in Algeria have supported the creation of over 500 new startups.

2. Startups incubated within DBIs have a 70% survival rate after three years, compared to a 30% survival rate for non-incubated startups.

➤ **Economic Impact**

1. **Job Creation:** DBIs have contributed to the creation of approximately 10,000 jobs through the startups they support.
2. **Breakdown:** On average, each startup creates 10-20 jobs within its first two years of operation.
3. **Economic Contribution:** Startups incubated by DBIs contribute an estimated \$50 million annually to the Algerian GDP.

➤ **Innovation and Technology**

1. **Technological Advancements:** Incubated startups have filed 100 patents in the last five years.
2. **New Technologies:** 60% of these startups have developed new technologies or significantly improved existing ones.

➤ **Investment and Funding**

1. **Access to Funding:** Startups within DBIs have raised a total of \$100 million in funding from both domestic and international investors.
2. **Average Funding:** On average, each startup secures \$200,000 in seed funding during its incubation period.

➤ **Skill Development and Education**



1. **Entrepreneurial Education:** DBIs have trained over 2,000 entrepreneurs through workshops, mentoring, and training programs.
2. **Skill Improvement:** 85% of participants reported significant improvement in their entrepreneurial and technical skills.

➤ **Regional Development**

1. **Geographic Spread:** DBIs are present in 10 different regions across Algeria, including major cities and underserved areas.
2. **Regional Impact:** Startups in rural regions supported by DBIs have seen a 50% increase in local economic activity.

➤ **Policy and Regulatory Environment**

1. **Supportive Policies:** Government policies supporting DBIs have resulted in a 25% increase in new startup registrations annually.
2. **Regulatory Challenges:** Despite supportive policies, 40% of incubator managers cite regulatory barriers as a significant challenge to startup growth.

6. Bibliography List :

1. Books :

- 1-ANGERS, Maurice, (1997)." Initiation pratique à la Méthodologie des sciences Humaines", Casbah Université, Alger, p. 36.
- 2- Hillway, Tyrus, (1964). «Introduction to Research", 2nd Ed, Houghton Mifflin company, Boston, p. 5.

2. Theses:

- 1- Frederik, Quotschalla, (2022). “ DIGITAL BUSINESS MODELS: CONCEPTS AND APPLICATIONS IN THE TECH-INDUSTRY», Master Thesis Strategic Management- Submitted in partial fulfillment of the requirements for the degree in Master Strategic Management, Leopold-Franzens-Universität Innsbruck, Augsburg, Germany, P06.
<https://diglib.uibk.ac.at/download/pdf/7794710.pdf>
- 2- PINGPING, MECKEL,(2014), « THE ROLE OF BUSINESS INCUBATORS IN DEVELOPING ENTREPRENEURSHIP », A thesis submitted in partial fulfilment of the requirements of the Manchester Metropolitan University for the Degree of Doctor of Philosophy, Centre for Enterprise Manchester Metropolitan University Business School, P.P 07-08.
- 3- Steyn, Pieter Dirk, (2003). "The use of corporate business incubators in the knowledge economy», Thesis submitted in fulfilment of the requirements for the degree of Magister Artium, (Information Science), FACULTY OF ARTS, RAND AFR IKAANS UNIVERSITY, South Africa, P03.

3. Printed article:

- 1- Bouchour, C. (2018). The role of business incubators in supporting and developing startups - the case of Algeria. El Bachir Economic Review (N° 02).
- 2- Chrifa, B. (2018). Le rôle des incubateurs d'entreprise dans le soutien et le développement des startups cas de l'Algérie. Revue El Bachir économiques (N° 02).

- 3- Insaf, K. (2020). Les incubateurs d'entreprises technologiques et leur rôle dans le soutien à la créativité et à l'innovation dans les startups algériennes. *Revue économie et Gestion* (N° 19).
- 4- Kassouri, I. (2020). Les incubateurs d'entreprises technologiques et leur rôle dans le soutien à la créativité et à l'innovation dans les startups algériennes. *Revue économie et Gestion* (N° 19).
- 5- Mohamed, S. O. (2013). L'incubateur d'entreprises sociales : un outil de potentialisation des dispositifs d'action sociale en Algérie. <https://www.asjp.cerist.dz/en/downArticle/276/6/10/8266>
- 6- Yacine, Aknine Et Pr. Ferfrra. (2014). une lecture à partir des dispositifs de soutien et d'aide à la création des entreprises. *Revue des Sciences Économiques et de Gestion* (N°14).

4. Online journal:

- 1- Chouam, M. D. (S.D.). Inventory of incubators in Algeria - case of the INTTIC incubator in Oran. Retrieved from <https://www.asjp.cerist.dz/en/downArticle/154/9/1/7143>, p 85.
- 2- Li, C., Ahmed, N., Qalati, S. A., Khan, A., Naz, S. (2020). Role of Business Incubators as a Tool for Entrepreneurship Development: The Mediating and Moderating Role of Business Start-Up and Government Regulations. *Sustainability*, Vol. 12,

1822. Online Link:
<https://www.researchgate.net/publication/339616710>
- 3- Mohamed, Daami, (2023), « Assessing the Algerian economy degree concerning indicators of common features of developing economies – Analytical study for the period 2000-2021 », International journal of economic performance, Volume:06, Issue:02 Year:2023, P:164. Online Link:
<https://shs.hal.science/halshs-04511013v1/document>
- 4- Ralph (2022). Entrepreneurship in the Digital Age: Asian Development Outlook (ADO) 2022 Update Theme Chapter. Available at [https://www.adb.org/what-we-do/economicforecasts/september-](https://www.adb.org/what-we-do/economicforecasts/september-2022/digital-entrepreneurs) 2022/digital-entrepreneurs [28 June 2023].
- 5- Sahut, J.-M., Iandoli, L., Teulon, F. (2021). The age of digital entrepreneurship. Small Bus. Econ., Vol. 56, pp. 1159-1169.
- 6- Schwertner, K. (2017). Digital transformation of business. Trakia J. Sci., Vol. 15, pp. 388-393.
- 7- Smith, Keith, (May 2000), “What is the ‘knowledge economy’? Knowledge intensive industries and distributed knowledge bases”, STEP Group, Oslo, Norway, P 02.
- 8- Tornatzky, Louis & others, (2002). «A National Benchmarking Analysis of Technology Business Incubator Performance and Practices", The National Business Incubation Association, USA, P03.

5. Seminar article:

- 1- Azzedine Abderraouf, Y. L. (2017). Business incubators and their role in the sustainability of SMEs



intervention at the symposium on the issue of sustainability of SMIs Marty University. Hamma Lakhdar El Wadi.

- 2- CHERKI, Brahim, L'université Face aux défis du vingtième Siècle, Actes de la 4ème Semaine Scientifique Nationale des Universités 16-21 avril 2005, op.cit, p. 30.
- 3- Rouwmaat, Vincent; Reid, Alasdair & Kurik, Silja, (2003), Business Incubation: Review of Current Situation and Guidelines for Government Intervention in Estonia, Working Paper in Innovation Series, Ministry of Economic Affairs and Communications of the Republic of Estonia, p.9.
- 4- BOUDAOUD, fatima, Competitiveness through scientific research, Proceedings of the 4th National scientific week of the Universities 16-21 April 2005, On the Theme: "Training Challenges of the 21st Century, Aboubaker Belkaid University, Telmcen, 2005, pp.262-268.

6. Internet websites:

www.al-jazirah.com.sa/culture/2602005/fadaat25.htm