

University in Morocco as an Actor Involved in the Development of Innovation inside the Clusters: Cases of «Aeropole Nouacer» and « Maroc Numirique Cluster»

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Abstract: *This publication aims to identify the role of the Moroccan university in the development of innovation in the clusters. To do this we will firstly present what it is a cluster, and the actors involved in its development. The idea is to take stock the role of the university as an actor involved in the creation of the necessary knowledge for innovation, also involved in the development of innovation skills, and in the exchange of knowledge inside a cluster. However, this analysis will be carried out simultaneously with the literature review in which we will clarify how the Moroccan university can play the role of an innovation actor and consequently an actor in the development of industrial clusters in Morocco, and this by two studies of cases, the first one is the aeronautical pole «Aeropole Nouaceur » and the second one is the « digital Morocco cluster».*

Keywords: Cluster, University; knowledge; innovation

1. Introduction

Under the shadow of globalization, competition has become fierce between companies, and between territories, nationally and internationally. As today the economy is heavily based on progressive knowledge, competitive advantages are built around research and development and the innovative capacity of companies. Also, in terms of industrial strategy and territorial development, new ways of doing things emerged, known as clusters or competitiveness clusters. Obviously with the presence of companies, these devices surely involve public authorities and territories, but they involve especially universities, laboratories and research centers. This article aims to identify the role of the university as an active player in the circle of the dynamics of learning and innovation studying the case of Morocco.

Firstly we will present the concept of the cluster and its emergence in Morocco, then we will treat the role of the university in the dynamics of innovation within Moroccan industrial and technological clusters. And in a third time we will explain how the university is the key to the competitiveness of the cluster.

2. Methodology

We adopted a documentary research methodology to study the emergence phenomenon of industrial clusters in Morocco, and the role of the Moroccan university in the dynamics of innovation within this agglomeration. The documents used are review articles, theses, and departmental reports, search engines, and specialized portals of study subject clusters.

1) Cluster or Pole of Competitiveness

The concept of cluster emerged in the late 19th century, Michael Porter brings the concept of industrial district up to

date in the 1980s under the term "cluster", but the paternity of industrial districts is given to the works of Alfred Marshall who analyzes industrial agglomeration from the perspective of external economies. According to him, external economies explain both the co-location of firms and the global efficiency of the district by generating benefits to be found nearby, P Malmberg and Maskell [16] 2002. The cluster is a concept that covers many areas. As far as we are concerned, we consider the cluster to be a geographical location where high skills and know-how are concentrated. The best-known example of clusters is Silicon Valley in the USA. According to this American model, businesses, universities and research laboratories are in the same geographical location, and all the actors thus benefit from a space for pooling and sharing knowledge and skills. Clusters are generally not far from major universities, the renowned clusters in the US are close to the most prestigious universities, for example the "Route 128" cluster in Boston is close to MIT and Harvard, and the cluster "Silicon Valley" is located around Stanford University in California. Total government involvement and an entrepreneurial spirit, combined with high levels of remuneration, have attracted a large number of engineers and foreign scientists to the US. Clusters in the USA have become one of the world's leading innovation incubators. Over time, the experience of American clusters has become a model of success. As a result, most developed countries and a number of emerging countries have tried to retake (copy) the model and build equivalent systems.

In 2005, France adopted a competitiveness cluster policy, which is, in a way, the equivalent French concept of the cluster. The cluster is a group of companies, universities, research centers and universities. Laboratories aiming through a collective approach to promote innovation and market development, the latter is based on an active partnership between industry, research centers and organizations for initial and in-service training. The concept

is completely framed by the public authorities either directly by the State or by local authorities.

Morocco, too, the cluster is defined as an association constituted in accordance with Dahir No. 1-58-376 dated (November 15, 1958) as it has been completed and amended, whose members are the enterprises, establishments and research and training centers and institutions, operating in the industrial and technological sectors, with a common development strategy and whose statutory purpose is to stimulate the emergence of innovative collaborative projects. Clustering policy is adopted in Morocco since 2006.

According to the Department of Studies and Financial Forecasting, the Greater Casablanca region has been at the center of economic and social development, considered as a fertile area for economic development through the development of local plans. These plans aim to highlight a coherent regional development project.

The benefits of such an approach have been felt through the emergence of a number of centers and metropolises and clusters in the region that have become hotbeds to promote economic activity, by dint of basic equipment, industrial zones, industrial and commercial fabric and existing services.

Giving to the Ministry of Economy and Finance, Morocco is resolutely engaged in a strategy that seeks to make investment both nationally and internationally, as a strategic support for economic and social growth through the implementation of institutional, economic, legislative and regulatory measures. By tax exemptions granted under ordinary law, Moroccan regulations provide for specific financial, fiscal and customs advantages to the investors in connection with investment agreements or contracts to be concluded with the State under condition of meeting certain specific criteria.

As part of the investment charter, a financing program has been set up. The Hassan II Fund for Economic and Social Development grants financial assistance for the construction or facilities acquisition to investment projects in certain industrial sectors. The fund can participate and support up to 30% of the cost of professional buildings and up to 15% for the acquisition of new facilities.

The sectors concerned are:

- Manufacture of equipment for the automotive industry.
- Manufacture of assembly components and electronic subassemblies.
- Manufacture of equipment for the aeronautical industry.

All these factors and elements make the Greater Casablanca region an attractive territory for foreign investors especially if we take the example of investors in the aeronautics sector in the industrial area "Aéroport" Nouaceur.

Almost 85% of the investments injected into the "Aéroport" Nouaceur are made by subsidiaries of the major French groups Safran, Dassault Aviation, Thales, Ratier-Figeac, Le piston Français, Mecachrome, Snecma, Matis, Zodiac and

Sagem. These activities are developed in the context of the new concept of competitive co-location, which enables leading French manufacturers to install part of their activities in Morocco, in order to gain more competitiveness on an international level.

Self-assurance has strengthened with the arrival of Canadian airplane manufacturer Bombardier Aerospace, which will encourage other aircraft manufacturers and foreign suppliers to come to Morocco that offers investors an attractive package including all factors of competitiveness. A significant role played by the entrepreneur between public policies aimed at fostering innovation and the creation of innovative companies. We thus find the image of the entrepreneur as a relay, as described by J.-B. Say [12], between the scientist who produces knowledge and the worker who applies it to industry.

According to experts, the aeronautics sector in Morocco is a very promising market with an average growth rate of 15 to 20% per year. The sector now represents nearly 15,000 employees and a billion-dollar export turnover. This good performance attracts more and more investors. In the same vein, the entrepreneur is also conceived as the unintentional creator of networks of externalities favoring the creation of new ideas and new markets. However, foreign direct investment (FDI) has been widely regarded as a vital channel contributing to the development of a host country's innovation through spillover effects on knowledge and skills.

2) The role of university as an actor of innovation and development of clusters in Morocco

a) The university as an actor of innovation

The university has played, everywhere and at all times, an undeniable role in economic, social and cultural development. It is also the place of embodied knowledge, in the different components of what economists call the economy of the immaterial, the knowledge related to the personal skills, know-how and experience of individuals. The role of the university is to work continuously to make knowledge accessible, to share it, to exploit it, to combine it in order to produce new knowledge. However, the production of new knowledge is only possible through research actions. The university is thus called upon to develop research that allows the realization of more or less important innovations. Innovations launch new product life cycles, improve productivity, enhance competitiveness, expand markets, etc. More generally, innovation encourages the creation of employment, or else it preserves existing jobs. Innovation favors local development and, more broadly, the economic and social development of territories.

Governments around the world - national, regional and local - are looking for ways to strengthen the role of universities as agents of local and regional economic development. In the United States, the adoption of a Bayh-Dole federal law in 1980 to promote the transfer of technology developed by universities to industry. If we limit ourselves to the research aspect, the university can be seen as a real driver of innovation, and consequently a tool for cluster development. Moreover, the experiences of clusters and competitiveness

clusters clearly confirm this relationship between the university and the companies in the cluster.

Among the objectives of the "Maroc innovation" strategic plan is the exploitation of the research and development capacity of Moroccan universities, and the development of any innovation that will be the subject of a patent. The question that arises is what is this strategy?

Relevant public policies include not only support for research but also support for the university. The idea of "building skills" refers to the ability to create, absorb and exploit knowledge by individuals and organizations. This capacity belongs to both the public sector (schools, universities) and the private sector (labor market, internal training). Organizations also acquire skills (organizational learning), particularly through interactions within different levels of innovation systems (business-researcher interaction).

Still for the example of the Nouaceur industrial zone or the Aéroport, the role of the university as an actor involved in the development of the latter was through the provision of training in the aeronautical sector, since the area knew the foundation a specialized Institute of Aeronautics and Airport Logistics, as well as the Institute of Aeronautic Professions, plus the installation of schools such as Mohammed VI International Academy, which provide the aeronautical market with the necessary human resources. Here we witness a university-cluster relationship focused on the transmission of knowledge, and the development of skills to meet the needs of the job market in the aeronautical sector. A little later, 70,000 laureates of vocational training per year, 5,000 engineers, and 5,000 technicians per year in different specialties: aeronautical trades. "The Greater Casablanca Regional Investment Center".

Aware of the importance of the availability of skills, Morocco has made vocational training a priority to support its development, it is expected to anticipate changes in employment and to innovate in terms of approaches and training methods. , to accompany the process of upgrading the country's economy.

The vocational training sector has developed, since 1987, a strong synergy with companies and professional associations that are strongly involved in the planning and management of training. In collaboration with the private sector, Morocco has set up a training program and that by the realization of specialized institutes to ensure the training of the different profiles in the aeronautical trades (IMA) which proposes for this sector generic or specific training for operators to succeed in recruiting human resources by developing their skills, and meet the continuing training needs of employees.

Cooperation with universities, research institutes or laboratories is important for the innovation of companies in the cluster as these "R&D institutions" are invested both in the production and coordination of technological and scientific knowledge but also in training, Walter W. Powell, Kenneth W. Koput, Douglas R. White, Jason Owen-Smith [22] the ability of local businesses to adopt new

technologies, and more generally new knowledge, and to use them productive way.

In a study of 26 industrial clusters in Canada, Wolfe and Gertler [23] reveal that local universities and research institutes represent a major creator of new and unique cognitive resources. Yet, note that universities, through joint research projects and distributed training, foster the innovation ownership capabilities of the project's partner companies rather than giving them opportunities for innovation.

b) The cluster is an environment that stimulates innovation:

In the context of the "Aéroport" Nouaceur agglomeration plays a central role in innovation, the role of institutions and public policies in the constitution and development of business clusters, in the tradition of industrial districts or local industrial systems, clusters appear as an important factor in the attractiveness of territories, in the face of external investments. and public policy in this sense seeks to create synergies between the world of research, whether in the university or in the enterprise, more generally, with public programs in favor of local innovation systems and clusters. Technological. The question is to know what the phenomenon of agglomeration provides in terms of innovation, the answer was provided by A. Marshall "The secrets of the industry cease to be secrets, they are so to speak in the air ... the merits of inventions and improvements in machinery, processes and the general organization of the industry are immediately discussed. If anyone finds a new idea, it is immediately taken up by others, and combined with ideas of their own; it thus becomes the source of other new ideas. The locations evolve in an evolutionary process. Local systems promote the transfer of tacit knowledge among universities, industries and institutions. There is a localized learning process.

According to J. Schumpeter [9], there are five types of innovation: process innovations, organizational innovations, product innovations, the discovery of new sources of raw materials and the opening of new markets.

In the Moroccan context, the first innovation lies in the introduction of the aerospace industry through the creation of the "Aéroport" Nouaceur, ie the emergence of an industry that has no technological precedent in the regional economy which involves the local creation of an entirely new industry. This, of course, is the kind of process that tends to be associated with universities. The opening on a new market, that of aeronautics an industry that has never existed in Morocco, so the new know-how that will be associated with the territory of Casablanca, innovation is also characterized by "the implementation the force of the new productive functions "or, in the words of Schumpeter [9]," when the economy does something else, outside of current practice, we can then speak of a creative response The second innovation is in the organizational mode, which is in the form of aeronautical cluster, that is to say the organization of industrial activity in the form of geographical concentrations of interconnected actors, industrial, scientific and local actors who are in competition, but also cooperate. The concentration on the same territory

of actors, of the same field or sector of activity brings to these actors a competitive advantage.

These innovations lead to an external economy linked to the external effects of circulating technology and to the localized learning processes of KRUGMAN actors [14] 1985. Indeed, the post-Fordist system of business competitiveness relies mainly on innovation and know-how in optimizing production costs. And this is the case of Morocco, which has managed to attract renowned investors in the aeronautical field to come install part of their production in Morocco, which offers a qualified workforce and with a cost three times cheaper than the European neighbor "Spain".

Here we are witnessing an innovation on several levels but we must keep in mind the important role of the actor of accompaniment in this innovative process of the aeronautical sector in Morocco, it is the university and the Moroccan school, firstly by the training of the human resources necessary for the opening on this new market and secondly, it is an indispensable player in the constitution of an innovating cluster and which accompanies simultaneously the requirements of development of a market.

According to the Bloomberg Innovation Index, a country's measure of innovation is based on seven indicators, namely research and development intensity, manufacturing value added, productivity, and high-tech density, the efficiency of the tertiary sector, the concentration of researchers and patenting activity. However, in the case study that we previously proposed on "Morocco Digital Cluster", in partnership with Mohammed V de Rabat University, promoting the research and innovation activity at regional and national level, by stimulating innovation from the results of academic research obtained alone or in collaboration with companies Not forgetting that the capital of innovation and innovation This university's patent is composed of more than 150 patent filings nationally and 30 internationally.

The "Morocco Digital Cluster" has come to the label of two training with Mohammed V University of Rabat, the objective is to prepare its laureates for the challenges of the mobile market and participate in the evolution of this sector in Morocco. "MarocNumérique Cluster" is a public / private mixed governance structure comprising several actors: State, Large companies, SMEs, education and research operators and aid and financing organizations with the ultimate goal of bringing projects to life. Innovative and high added value in the four niches of excellence of the Cluster namely: Mobile services Security, electronic banking, digital rights, Multimedia, Software packages.

The actions towards the realization of the strategic plan "MarocInnovation" appear in consolidation, and we think that Morocco would benefit from building an innovative industrial policy based on research and development approaches. The construction of such a strategy can be seen as a way of counteracting globalization, but also a way to integrate into the global market by putting in place locally, sufficiently in advance the appropriate devices. This innovative industrial strategy reinforces the industrial

strategy already developed by the public authorities by further integrating universities and research centers according to the models of clusters and competitiveness clusters. Porter recommends in particular the establishment of strong cooperation links with universities and local research centers in order to avoid knowledge leakage outside the cluster. Parallel to these cooperative relationships, he advocates the existence of internal competition in order to constantly maintain positive competitive pressure, accelerating the innovation process, Porter [18] 1998.

3) University is the key to cluster competitiveness

Small businesses that collaborate with academic research do so mostly on short-term projects and focus on immediate resolution of problems with the products they want to sell. According to the Oslo Manual of the Organization for Economic Co-operation and Development (OECD), which defines innovation as the development or commercialization of a more efficient product in order to provide the consumer with objectively new services or improved.

While large companies tend to establish longer and more structured partnerships with the university, often through the funding of research chairs by associating researchers from the university with the work of the company. However, even these show a greater interest in product development than in exploratory research. The focus is on incremental innovations that lead directly to marketing opportunities. Companies that do not interact with the university explain it in particular by a marketing horizon of 6 to 18 months, whereas the time required for a university research project is rather of the order of 2 to 3 years, of many companies have also reduced their research and development activities internally and are increasingly using external sources of knowledge and technology to reduce the costs and risks of research. Variations in the nature of innovation have accentuated the importance of productive working relationships between universities and societies, and have exposed the complex relationships between universities and their local economic sector. These relationships now go beyond a simple provision of graduates and researchers, R Richard K. Lester [19] "Universities, Innovation and the Competitiveness of Local Economics" emphasizes that the role of the university in the processes of local innovation largely depends on the nature of the local economy. At different stages of industrial transformation, the local innovation system needs universities and research institutes to perform the various tasks. In a local innovation system that benefits from an advanced level (as a platform for innovation in the global knowledge economy), universities are bridges of exchange in this economy between countries and regions. Universities can be "intermediaries" of knowledge exchange, reservoirs of intelligence, favoring the flow of highly qualified international staff, able in turn to attract companies with high added value. NESTA [5] 2007, Five Ways Universities Drive Innovation.

It is clear that in local innovation systems that are less well developed, universities will not be able to have the same tasks. "Not all local economies are comparable to Silicon Valley, not all sectors of the economy look like biotech or IT, not all universities are Stanford" Lester. Local / regional innovation systems and the roles played by local / regional

universities need to be adapted to their own contexts. It is observed, however, that the university generally performs certain tasks in terms of key competitiveness innovation:

- First, in creating the knowledge needed for innovation and developing innovation skills.
- Second in the exchange of knowledge.
- And lately it is a hub in an international network of knowledge.

When a new industry is created, a local university or public research laboratory usually acts as an anchor institution. The university may also perform different tasks, depending on the economic context of the area in which it is located. It is about going beyond the "university-business technology transfer model" that dominated the first generation of thinking about knowledge-based regional economies.

The role played by universities is essential in this dynamic of knowledge Berthinier-Poncet [4] 2011, training practices provide actors with the knowledge and skills needed to engage in new practices or interact in new structures. Economic success is also the ability to adapt to new markets and new technological opportunities.

3. Conclusion

Innovation is strongly influenced and stimulated by the immediate environment and depends strictly on the quality of the infrastructures supporting industrial public policies, financial institutions and innovation trajectories at a national or regional level. Morocco has invested a great deal in these areas. Latest years in the priority areas, but we must move forward and find the right mechanisms to further energize the relationships that must exist between the university, research centers, research laboratories and their socio-economic environment. In addition to its training mission, the Moroccan university must, in the field of applied research, get adapted work differently, communicate better and go to companies. To do this, it is important at this level that the authorities put in place appropriate frameworks and facilitators for all actors. Nowadays, the university is in a fairly new position in society. It faces a new role with few precedents on which to build. We have just realized that the invisible product of the university, knowledge, can be the most powerful element of our culture and influence the ups and downs of professions and even social classes, regions and even nations.

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