

UNIVERSITY-COMPANY COLLABORATION: WHAT ARE THE OBSTACLES IN ALGERIA?

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Abstract: *Partnership with companies is particularly important in the higher education and research sectors in Algeria. Indeed, the university-company partnership is part of the university's mission to enable it to be in symbiosis with its economic environment through multiple gateways from the university to the industrial companies and conversely.*

This paper summarizes the arguments and counterarguments within the scientific discussion on the issue the reality of the research partnership between university institutions and industrial companies.

The main purpose of the research is to identify the most important requirements of the research partnership and its obstacles. This article will address three (03) essential points: First, we present the literature review on the university/business relationship by addressing its importance for development. Second, we will present the methodological approach. The choice of a qualitative survey by interviews is due to the objective of our research, which is to obtain in-depth information, difficult to express quantitatively on the subject of study. The interviews were conducted with higher education professors and officials of economic companies. Thirdly, we will advance results and some elements of appreciation on the reality of this relationship.

The research empirically indicated that the level of research partnership between university institutions and industrial institutions was low. The study also showed that although cooperation between universities and industrial institutions has become an urgent and confirmed necessity in political discourses and in legislative laws and has been the subject of discussions for several years. This relationship is distinguished by Fragility and superficiality. The study recommended the need for university institutions to adopt the concept of research partnership within their strategic directions, as well as work to consolidate the mutual relationship between university leaders and officials in economic institutions.

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1. Introduction

Since its creation to date, the University has undergone many developments and changes, due to several factors, some of which come from within as a process of self-development and growth, both in its functions or its organizational structure, and others due to the external impact through its reaction to social changes and needs of society outside (Kwon, 2015), as most models of higher education raised at this time, are based in their philosophy on the need for a correlation with society, through channels of active participation in the activities of all its productive and service institutions. This cooperation has enabled many higher education institutions to emerge from their ivory towers and become community service stations. (Keynan, 2014)

Although many theoretical and practical studies have highlighted the importance of boosting cooperation between universities and productive companies, (Prigge, 2005), and despite UNESCO's recommendations on the importance of building alliances between higher education and other sectors, and despite the recommendations of several studies on the need to find mechanisms to link higher education to productive enterprises, as the information revolution requires highly qualified functions in the services, the information industry, in addition to advanced organizational and management capabilities.

It is also essential to strengthen the links between higher education institutions and the various sectors of production, because of their important role in overall development, since this can have an influence on both. It helps, on the one hand, production companies to develop production, improve their quality and strengthen their competitive capacities both nationally and internationally (ISIS) 2010. And on the other hand, it increases the technical capacities of its human resources, thus allowing, the increase of technical capacities, the qualification of executives, and providing feedback to enable the identification of research priorities within the University in order to develop production. (Heaton, Siegel, Teece, 2019)

Cooperation between universities and industry is crucial for both sides. Universities benefit from this cooperation, on the one hand, to support study and research projects within the university in order to develop the university's knowledge, and to provide students and academics with the latest knowledge created inside. And on the other hand, it provides the industrial sector with the knowledge and technology needed to acquire competitive advantages, profitable projects, develop its administrative and industrial processes, achieve the best results and save money, time and effort without using external sources. (Veugelers, Del Rey, 2015).

Algeria's university system has witnessed many reforms in which it has tried to link its objectives to society's needs and development requirements. Since Algeria has experience and expertise in cooperation, which dates back to the 1970s, related to manufactured industry; which consists of bringing the economic company and training closer to political and economic sovereignty. Thus, every institution had to include in its budget a subject devoted to continuous training and trainees' reception (Benziane, 2004). However, the cooperation between the University and the company could not achieve the goals for which it has been created, and numerous studies have shown that our universities continue to live separately from their communities and need more interaction with them (Chohra, 2019), as they still suffer from a lack of resources, as a result of their total and exclusive reliance on State funding, especially in view of the increasing numbers of students seeking to pursue higher education, on the one hand, and in view of the challenges pushing it to expand, diversify disciplines using modern technology and opening up at all levels. Hence, where is the imbalance in achieving this partnership between the University of Algeria and industrial companies? And what constraints impede partnership's achievement of its objectives?

The importance of the present research lies in its attempt to address an important issue on the premise that in the development status of any nation, the University must play the main role; since the traditional view of her being only a "scientific institution", is no longer seen. It is viewed as importantly as an "economic institution», a fact to which many developed and developing countries alike are being conscious of. The importance of the current research is significant as:

- It addresses a topic relevant to the implementation of the role of the University in the service of society, becoming a general social philosophy, guiding the University in the exercise of its other roles: "Education and research". There is growing interest in the functions which consist of scientific research and

community service at global, regional and local levels, as progress of societies is measured by their ability to possess strong human resources, trained at highest levels in different disciplines.

- Current research may open up broader horizons in the area of cooperation, since it is an extension of previous studies in this field, and at the same time is a prelude to other new studies.
- Identify obstacles to achieving a partnership between university education and industrial companies, and proposals through which the University's relationship with the industry can be developed in the future.

2. Relationship between University and Industry: Literature review

Cooperation between the University and economic companies is defined as the establishment of some kind of organizational arrangement, between the University and one or more productive companies. Through this cooperation, the University provides its different scientific expertise to partner productive companies. Partner companies provide in return, the necessary financial support to provide such expertise, thereby contributing to each party's achievement of its objectives. Some argue that the cooperation philosophy is based on a shared commitment to the cooperation's objectives, pursuing them by defining roles and assuming responsibility, recognizing that there is a difference of priorities and potential, and that partnership works towards these priorities and complementing these priorities and potential. It also achieves this through constructive dialogue and transparency, overcoming the first obstacles, and seeking added value for the partnership (Don and Word 1982).

Collaboration facilitates the transmission and sharing of knowledge, which helps to foster long-term connections between advanced education institutions and businesses (Marinho, Silva, Santos, 2020)

The University's relationship with industry aims at the knowledge industry; by applying scientific knowledge created by universities and research centers, leading to new and innovative practices. In order to enhance knowledge in all institutions, it is necessary to establish a system of knowledge flow between them, based on the dynamic transfer of applied scientific knowledge (Lu & Wang, 2007).

Besides, companies' assimilation of scientific knowledge qualifies them and enables them to produce innovative products, while the university's assimilation of knowledge applications guides the results of its scientific research, to be closer to the needs of society. Correspondingly, uniting both levels of knowledge supports social and economic development, through innovative activities.

Several experimental researches have also been conducted to identify the main channels used in the relationship between the University and the industry. These channels consist of: conferences and workshops, joint supervision of master's and doctoral theses, licensing of university patents by companies - purchase of models developed by universities, joint publications - lectures, training at universities, by corporate staff, joint development research projects, Schartinger & al., 2002:305; Bekkers & Freitas, 2008: (Universities with (Ilkan.) 1841; Ostergaard: 2009: 198; Zawislak & Dalmarco, 2010. Other studies also emphasized the importance of combining industry-university-science in order to ensure the quality of teaching and research activities in universities as centers of intellectual potential (Artyukhov, Krmela, Krmelova, Volk, 2021).

3. Methodology of the study

The choice of a qualitative survey is based on the objective of our research, which is to obtain in-depth information, that is difficult to express quantitatively or statistically on the subject of study.

The interviews conducted were directive, based on a series of specific and open-ended questions. The same questions were asked to all members of the sample in the same manner and in the same order. Two interview guides were prepared: one for professors and the other for manufacturers.

To analyze these interviews, after their transcription, we used a thematic analysis, organizing and classifying the data into specific themes and categories, and identifying common points. Then, we explained and interpreted them in an analytical way, in order to reveal the insights sought, behind our study.

In order to determine the characteristics of the target community on which our study was conducted, we have put these data in the following table, which shows the distribution of respondents, according to their age, position held, seniority and the institution to which they belong.

Table.1 The characteristics of the interviewees

Respondent	Rank or position	Years of Experience	Institution
01	Higher Education teacher	20	faculty of chemistry USTHB
02	Higher Education teacher and research laboratory officer	22	Faculty of civil engineering
03	Higher Education teacher	30	Faculty of economic sciences
04	Department head	15	Electronics department National polytechnic school
05	Higher Education teacher and research laboratory officer	15	Faculty of Computing USTHB
06	R D Department manager	10	Electronics manufacturing Company
07	External Relations Manager	08	Food manufacturing Company
08	Manufacturing Company head	15	Electronic manufacturing company
09	Department Head and Manager	09	Steel Industry Company

Source: compiled by author.

4. Empirical results

Through analysis of interviews conducted with higher education teachers in different disciplines as well as industrialists, we have concluded that cooperation between the university and the industrial sector faces many challenges and problems. For instance, there is a lack of funding for scientific research at the university, and insufficient budgets are allocated to conduct research in appropriate ways. Besides, most teachers focus more on the teaching process rather than on scientific research, as well as the lack of specialized bodies in most institutes to market research, and its results according to an economic plan to recipients, which indicates poor coordination between the university and the industrial sector, as well as the absence of strategic steps for the use and financing of research results, in order to transform these results into profitable economic projects, in addition to the weak infrastructure for theoretical and applied research from laboratories to devices. In this regard, one professor affirms:

'Patents are paid by researchers... the texts exist, we have a chapter on payment but when we get to practice, the accounting agent will not write a cheque for fifteen thousand dinars.... The project starts but with little resources. By the way, we make wooden parts, we assemble with glue, and we buy components ourselves. We buy what is cheap, and less efficient, and show that it works.'

Although the scientific research budget has been raised in order to bridge cooperation between universities and economic companies in the country, reality is very different from that of our researchers. This explains that legislative texts and political speeches exist and emphasize the need to support scientific research, and the university, and to link its objectives to the objectives of the industrial sector. However, its application faces many obstacles such as flaws in laws and administrative procedures, which contribute to providing an attractive environment for researchers, as well as industrialists. And that's what one of the professors says: *"In terms of research funding, we are at 0.54 of GDP, which includes wages... funding research in Algeria is done through public finance... In Western countries, companies finance research up to 60%, and here I go back to my main answer: this is the main thrust of the effort, if we want to have the impact of research, we have to relaunch research at the company level"*.

Among other obstacles to achieving this cooperation, there are educational programs, which do not keep pace with society's economic developments, since the knowledge inculcated to the student is inconsistent with the development in society, which is rapidly evolving. The student is still studying the old curriculum, which is not in tune with what is happening in the outside environment of the university, in addition to the small amount of time devoted to practical lessons, as confirmed by one of the teachers: *"The university remains our reference; however, it must produce usable results... I'm an academic, and I mentor PhD students, so I know what's going on at the university— teaching methods remain in the theoretical domain and do not meet the needs of industry... knowledge should not be sought for knowledge; the university must find operational solutions to its LMD system; student training must meet the needs of industry"*.

Industrial companies are rapidly evolving, while the university still offers old lessons and curricula, as well as the difficulties of its continuous development, in line with the industry, which makes the recruitment process hard. The student finds himself in front of a job requirement, whose fundamentals he does not know because he has not been exposed to during his school career, as well as the generality of specialties sometimes, and the lack of specific disciplines required by industrialists, which hinders benefitting from them, as well as the low willingness of industrial companies, to participate in the costs of research projects, which undermines industrial companies' confidence in human skills outputs, programs, research and scientific studies, their lack of conviction about their usefulness and their recourse to foreign firms for consulting, as demonstrated by an electronics manufacturer who believes that: *"There is an inherent mismatch in the research trends in companies and universities, with disproportionate importance for business results in companies, and on basic research in universities. Cooperation is costly and returns are only achieved in the medium to long term, whilst companies seek short-term results, and clear contributions to current business affairs"*.

Another manufacturing company's manager adds: *"In most universities, curricula are not interlinked and sometimes contradictory, and often do not allow students to think scientifically or creatively. They do not allow them to face global challenges and variables, because all courses and even university research are theoretical"*.

Thus, we conclude that catching up on changes and developments in the external environment will not come, if only production is focused on. We should also concentrate on the human factor and its education according to this development, which is considered as investment. Therefore, the involvement of industrialists in the preparation of educational programs is important by identifying their needs, and the requirements of the positions and functions granted by their companies, especially in this area, which has become an important criterion for the development of society, after the world's transition from the age of industry to the age of information.

In addition to the foregoing, we have concluded that the relationship between industrial companies and universities is temporary and volatile, and is marred by many imbalances, such as the lack of confidence, lack of knowledge of others needs, lack of participation and unrealistic expectations on both sides. The relationship between universities and companies is characterized by mistrust, which has led company owners to import technology from abroad, for fear of dissipating their capital in worthless research.

In addition to the general academic disciplines of the university, there is the lack of accurate disciplines in the departments of faculties and universities, which impedes the industry's access to them, and reduces the opportunities for the depth, necessary to serve industrial research needs. In addition to the difficulty of continuous development of curricula and subjects that are commensurate with the needs of the industrials, and only in a few individual cases involve the industrialists in articulating their point of view, when designing or modifying such programs.

- There are no intermediate offices or centers to link the industry to the University together and find joint ventures between them.
- Productive companies are blunted by the prevailing impression that the quality of university research is purely academic, that cannot be used nor is it compatible with its requirements, the lack of a close and fruitful link between scientific research and development goals and plans.

5. Conclusions

The University is an open space which has its inputs and outputs. It is not possible to isolate it from the outside world. Thus, seeking to create channels of communication between the University and industrial companies is the key to both parties' success.

After presenting the preliminary results of our study, on the existence of cooperation between Algerian universities and industrial companies, we found that it has not yet reached the desired level, because of the many obstacles that we mentioned in this intervention. Although cooperation between universities and industrial companies has become an urgent and certain necessity in political discourses and legislative acts, and has been the subject of discussion for several years, this relationship is characterized by fragility and superficiality, which leads us to open new paths of research and to raise new questions, in the light of our preliminary findings: can the barriers to

cooperation between the University of Algeria and industry be regarded as a matter of historical, cultural, cognitive, social, institutional or techno-economic dimensions?

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