Autonomy, Governance and Quality Assurance in Tunisia: Case of Center of Biotechnology of Sfax

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Abstract
The objective of this article is to prove that managerial practice in a research structure can be strengthened through the establishment of a results-oriented management mode (QSE & accreditation) and the adoption of a sustainable system for planning, implementing, and monitoring its strategy, as well as the development of a system for continuously improving its performance.

Major governance changes associated with recognition through the certification of the QSE system and accreditation of three analytical parameters will strengthen the credibility regarding the socio-economic environment and the national, and international partners.

Keywords: CBS, Quality, Environment, Security (QSE), governance, continuous improvement, performance, Integrated System, management.

1. Introduction

The national conferences on reform in Tunisia, held in December 2017, reinforced the need for the main players in the higher education and scientific research ministries to implement the reform and, as a priority, the consensus resolutions that emerged from them. As a matter of fact, the modernization of the higher education and scientific research system, and its harmonization with the best international management practices in terms of autonomy, accountability, and performance were key recommendations of the reform.

In this framework, and through the Higher Education modernization Project supporting Employability "PROMESSE", the field of research and innovation has benefited from several calls for proposals, notably the PAQ-COLLABORA (PARI-TECK) and the PAQ-POST PFE&MFE (VRR JUNIOR) for the valorization of innovative results, the PAQ-pre-seed and scientific triage (PAQ-PAES) to support the creation of spin-offs. Thus, the Research Centers and Support Structures have benefited from PAQ (PAQ-CR2S) to strengthen the autonomy and governance of the main innovation research system structures.

Through this article, we will first present some autonomy and governance experiences in universities around the world, and then talk specifically about the experience in Tunisia.

We will afterwards focus on the experience of the Center of Biotechnology of Sfax (CBS) in 2021, as part of the PAQCR2S project, in terms of ‘Autonomy’, ‘Governance’ and ‘Quality Assurance’. This experience relates to the implementation of an integrated QSE system following international standards ISO9001:2015, ISO14001:2015, and ISO 45001:2018 in the fields of biotechnological research, development activities, and research results exploration activities, technology transfer, and accreditation system according to ISO/IEC 17025: 2017 for three analytical parameters.

Finally, we present the most important recorded and expected results for this purpose with some conclusions and recommendations.

2. Autonomy and governance experiences in universities worldwide

Before reviewing some of the worldwide experiences in autonomy, and governance, it is important to focus on the definition of these concepts

2.1 Definition and evolution of autonomy and governance concepts:

The concept of ‘university autonomy’ was used to designate the new university model that was promoted in Europe by the Poland agreement, which gave a new meaning to the concept of ‘autonomy’, by highlighting the meaning of the transformation of a university into an administrative entity, based on the business model [1].

It should be noted that the independence of the university covers two dimensions or two aspects:
External autonomy: the university is protected from political and religious pressures as well as economic pressures with stable funding.

Internal autonomy: it is the ability to self-regulate the members of the university, which allows them to define the principles that underlie the missions of the university [1].

Historically, the first university organization in Europe (the first era of universities, between the 12th and 18th centuries) was based on a model of one or more institutions (internal autonomy), that were able to enact their own operating laws, independently of political power while remaining under the tutelage of the Church which allowed to grant the "license", the degree to which it gives permission to teach (external autonomy) [2].

At the same time, the Islamic world did not define "universities" in the specific sense of the term, but with well-known educational centers, supported by a public charity (the donation system) where they are not regulated by the system of companies and privileges, but by the model of free competition [3].

With the development of nation-states starting from the eighteenth century, especially during the nineteenth century, the second era of universities began, when the university was considered one of the nation's spearheads, as the university was subject to state control and thus its funding became essentially public or exclusive and was absorbed by the members of the University as civil servants. Moreover, the university is defined not only as a place of knowledge exchange but also as a place of discovery and progress for the nation, and more broadly for shared humanity. The independence of the university here becomes mainly pedagogical and scientific [2].

This is how the concept of a national university, a source of progress, was born and has been implemented in Tunisia since its independence [4].

It should be noted that the economic crisis and the globalization of higher education, as well as the emergence of the economy of knowledge that accompanied the digital revolution, have created a new landscape for higher education. It presents itself as a dynamic of European convergence, integrating European universities into a globalized university "market" [5].

As part of the university's administrative redefinition, four forms of autonomy are needed to develop this new type of university:

- Academic autonomy, which refers to the ability to decide on the direction and content of training and research conducted within the university,
- Organizational autonomy which corresponds to the ability to appoint its governing and organizational bodies within the university (such as laws and regulations),
- Financial autonomy including the ability to provide its own resources,
- The autonomy of human resources, which is linked to the ability to reform the employment, salaries, and careers of university members,

2.2 Autonomy and governance in European universities:

The Association of European Universities regularly publishes a dashboard [6] "On autonomy" in European universities since 2010, referencing the four dimensions of autonomy in academic, organizational, financial, and human resources, measured according to nearly thirty indicators:

The university's level of academic independence is judged by its ability to determine its total students’ capacity, its ability to select students, its freedom to determine areas and content of training, the choice of the study language, or the management of the quality assurance system.

Organizational independence is assessed by different criteria such as the ability to decide the internal organization of the university, the ability to appoint or dismiss administrators, the freedom to define the criteria inherent in such an appointment, the duration of the conditions but also the participation of persons outside the university in the governing bodies, the ability to decide to create academic structures or even legal entities such as foundations.

Financial independence is assessed according to the following criteria: the duration and type of public financing, the ability to borrow private funds and buildings, the creation of budgetary reserves, or the determination of the level of tuition fees.

As far as human resources management, universities are compared according to their freedom to decide about recruitment and dismissal procedures, career development, and also salary level. It is worth noting that the European University Association provides an interesting network of analysis and allows for comparisons between higher education systems, no matter how different they may be [6]. However, significant gaps between the law and the exercise of autonomy are noticed in some countries such as Cyprus,
The United Kingdom is one of the best European education institutions, three of which regularly appear in the top ten of the world rankings.

2.3 The British model

The United Kingdom is one of the best European countries for higher education institutions, with approximately 166 universities that regularly appear in the top ten of the world rankings.

However, France and Italy remain among the countries that grant the least "independence" in the sense of the European Union (of the countries compared, Italy ranks 16, France 20), where higher education is still largely controlled by the state [6]. Universities retain little room for decision, particularly regarding the conditions for appointing employees, the representative mandate, or the conditions of exemption for their leaders. [6].

In France, even though they are designated by selection committees at the level of each university, the job profiles integrate the expectations of the institution in terms of teaching, research, collective investment, and staffing. As a result, teachers and researchers are still subject to a national qualification, by the National University Council, and the State organizes the salary development network.

In addition, since 2010, Italy has implemented a competitive system allowing public universities to allocate public funds, based on performance. This reform confirms the transition to a new model of public administration.

It should be noted that the Bologna Agreement has been the main influence over the last fifteen years to accelerate the administrative transformation of universities, with the dissemination of new practices, within the framework of quality assurance.

2.4 Systemic governance of universities in Quebec

A thematic analysis in Quebec [7], conducted on 77 official documents (29 of which were from Quebec) and on transcripts of 93 interviews (30 of which were from Quebec), identified three main dimensions of systemic governance:

1 https://www.topuniversities.com/university-rankings/world-university-rankings/2019
The legislative and regulatory framework,
The accounting status and budgetary rules,
Government intervention in the internal management of universities.

The objective of this analysis was to examine the systemic governance of universities in Quebec and to compare it to that of other Canadian provinces.

The analysis reveals that the autonomy enjoyed by universities varies from province to province, with Nova Scotia and Ontario universities enjoying more autonomy than their counterparts in Alberta and British Columbia. Quebec would be in the middle overall as it has two university sectors whose dimensions suggest different levels of autonomy. [7]

[8] believed that Canadian universities had more autonomy than their counterparts in other countries (notably France). Comparing Canada to other countries remains, however, tricky since education is a provincial jurisdiction.

Although the federal government is involved in funding research, professional training, student financial assistance, and education in aboriginal communities, there are in fact ten systems of higher education in Canada, each structured by specific governance systems [9]; [10].

It is to be noted that the concept of governance refers to multiple phenomena, ranging from the establishment of public-private partnerships [11] to the replacement of unilateral state action by a consensual and pluralist decision-making mode [12]. Governance can thus refer to a conception of public action according to which power is exercised in a flexible manner in an environment where civil society, businesses, and the State constitute networks of autonomous but interdependent actors [13].

2.5 University governance reform in Japan

In Japan, university governance - traditionally based on collegiality among teachers - has long been the subject of debate. While this collegiality was relatively well respected after the war, this has not been the case since the mid-1990s. The Ministry of Education (MEXT) has continuously strengthened the university leadership around the president at the expense of the faculty councils and has taken steps to develop relations between universities and the outside world (including the participation of outsiders in the university administration) [14].

In 2004, the national universities (those dependent on the state) formed themselves as autonomous institutions under public law (national university institutions: NUIs) with more leeway in their management, and moved to a new directive mode of governance, largely inspired by the new public management.

In June 2014, the School Education Law, governing the Japanese school system was amended regarding university governance. For national universities, this was supplemented by the amendment of the National University Institutions Act regarding their own management regulations. The law amending these two laws - the so-called University Governance Reform Law - came into effect on April 1, 2015[14].

2.6 Governance of Moroccan universities

In the context of university governance in Morocco, [15] states that it is necessary to be concerned about major issues such as the role of the Ministry of Higher Education and its regulatory role. In addition, academic freedom and university autonomy as well as the financing of the Moroccan university were among the issues addressed.

Furthermore, the Moroccan Canadian project "PROCADEM" has identified a profile of strategic competencies expected in the perspective of a new managerial culture that includes ten strategic competencies.

The organizational model therefore impacts university governance. The upheavals in the higher education system worldwide mean that the organizational model must be constantly revised or adapted [15].

In addition to the organizational and legislative aspect, the development of the managerial capacities of the Moroccan public higher education system's executives is crucial for good university governance in Morocco.

2.7 University governance in Algeria and Saudi Arabia

It is worth mentioning that the mechanisms of university governance in Algeria and Saudi Arabia are, in general, characterized by:

- The dependence of universities on the political powers of the country [16].
- Centralization and low participation of the teaching staff in decision making;
- Rigidity of the organizational structures in place;
- The absence of academic freedom [17].
These two countries have adopted a university model focused on the state more than on the other two models namely:

- The market-centered type or the academic type if we refer to the taxonomy of [18].
- The state-centered type means that the state itself makes the major decisions in higher education institutions. As for the university itself, it merely plays the role of a state agency whose main mission is to meet the state's requirements and the socio-economic goals set by the government instead of considering the requirements of the market and academic freedom [17].

3. Autonomy and governance of universities in Tunisia

The current situation of universities in terms of governance and quality assurance cannot be understood without reference to the reforms undertaken since the year 2000, and it can be summarized as an ambitious reform when the principle of autonomy and the definition of a new offer for universities was expressly applied under the law of 2008, which led to profound changes in the structure of Tunisian universities.

However, few of the provisions planned for 2008 have been fully implemented, for various reasons that need to be analyzed. Indeed, the failure of responsible actors to implement the reform in institutions and universities, the lack of support, and the emphasis on the absence of a common vision for the future of the Tunisian university, are often put forward with different, even contradictory, conceptions. In 2008, a law established new relations between the Ministry of Higher Education and Scientific Research and the universities through the establishment of contractualization, associated with the definition of strategies at all levels.

It emphasized the development of the independence of institutions with the systematic implementation of quality assurance, new management tools and the adoption of the new budget (GBO), which will help universities and institutions to move from a public administrative institution (EPA) to a scientific and technological institution (EPST) and thus reinforcing the principle of independence.

The main objective of this structural change is to allow universities to have some financial autonomy through the abolition of the previous budgetary oversight and the adoption of commercial accounting.

Later, in 2017, the national reform conference reinforced the need for key actors in higher education and scientific research to implement the reform, as modernizing the higher education system and aligning it with international best management practices in terms of autonomy, accountability, and performance were among the main recommendations for reform. This strategic plan contains the five general objectives listed in the tables in Annex 2, which are:

1) Improve the quality of university education and the employability of graduates.
2) Encourage research and innovation
3) Promote good governance and improve resource management
4) Revise the university map for a better regional balance
5) Encourage the pedagogical training of teachers

4: Autonomy, quality assurance and governance at the Center of Biotechnology of Sfax.

The Center of Biotechnology of Sfax, is a public institution with scientific and technological character, has adopted commercial accounting since January 2011, contributes to the development of scientific research in the field of biotechnology, and integrates it into the economic field. It participates in research projects at the national and international levels. It includes 47 researchers, 16 engineers, and 67 support staff.

The research structure of the center included, during the 2019-2022 program contract, 06 research laboratories, 04 specialized units, and a scientific information and documentation unit.

A certificate of thanks and encouragement was awarded to it, in July 2015 for its distinction in filing patents for research centers for the years 2013/2015. In the last five years, the center has achieved a number of successes, the most important of which are:

✓ Its active and positive participation in numerous research projects concluded in the framework of international cooperation

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2 Decree No. 2008-3581 of November 21, 2008, setting the conditions for transforming the character of universities, higher education and research establishments and public scientific research establishments into public establishments of a scientific and technological nature.

A remarkable increase in the center's own resources
An important scientific production of about 500 articles, with the realization of more than 10 doctoral theses annually.
Confirmed competences for the researchers of the center.
International recognition of its QMS through the ISO 9001:2015 certificate as indicated in annex N°3.

In order to reach other levels of success, the strategy of the Biotechnology Center of Sfax for the years 2019-2022 has been included in the national strategy of higher education and scientific research, which is to put all the skills at the service of the national development in all its dimensions, strengthen the quality of educational programs and stimulate scientific distinction, as this strategy included the following two axes:
- Research and Renovation (see Table 6 in Annex 2).
- Training and technology transfer (see Table 7 in Annex 2).
In order to achieve the objectives (see Table 8 in Annex 2), a number of indicators have been monitored in order to measure the most important performances and activities.

In order to achieve the second objective, that of the Promotion of research and innovation, the Center has been engaged since March 2019 in the project to support the quality of research centers and support structures "PAQCR2S" in the framework of a project to implement an integrated quality management system in accordance with international standards 9001:2015, 14001:2015, 45001:2018 and 17025:2017, the strengths and weaknesses of the level of performance were followed, as shown in Figures 2, 3, 4, 5, 6, 7 and 8 (see Annex 1). In addition, it was identified that:
- The compliance rate with respect to the requirements for Chapter 4 is rated at 100%. This compliance is explained by the first experience, in 2015, concluded by the CBS obtaining the certificate of its QMS according to ISO 9001:2015.
- The compliance rate with respect to the requirements relating to Chapter 5 is evaluated at 100%. This compliance is explained by the strong and continuous commitment of the management since 2015 and the provision of the necessary resources.
- The compliance rate with respect to the requirements relating to Chapter 6 is evaluated at 82.34%. It should be noted that the compliance rate for 6.1 is low, 60%, which explains that the actions to be implemented to address the risks and opportunities are affected by the health situation related to the pandemic COVID_19.
- The rate of compliance with the requirements related to chapter 7 is evaluated at 78.81%. The results obtained show that the CBS is called upon to strengthen its communication strategy (7.4). Its compliance rate with the requirements is evaluated at 60%.
- The rate of compliance with the requirements relating to chapter 8 is evaluated at 68.72%. A particular attention is attributed to the control of the elements of nonconforming output (to 8.7).
- The rate of compliance with the requirements of Chapter 9 is estimated at 69.65%. It is important to note that the internal audits as well as the management review are partially carried out during 2020 as the CBS intends to change its QMS into an Integrated QSE system.
- The rate of compliance with the requirements of chapter 10 is evaluated at 62.76%. Indeed, the CBS has partially identified and selected the opportunities for improvement and has partially undertaken the necessary actions to meet the requirements of its PIPs in order to increase their satisfaction.

In summary of the self-assessment of the degree of compliance with the requirements of ISO 9001:2015, the CBS QMS has 75.94% compliance as shown in the figure below.
In the face of a promising compliance rate, this does not prevent further work on Chapter 10 and more specifically in the identification and selection of opportunities for improvement and undertaking the necessary actions to meet the requirements of the PIPs to increase their satisfaction.

In what follows, we present the results obtained during the diagnosis carried out according to the environmental standard ISO 14001:2015 as shown in Figures 10, 11, 12, 3, 14, 15 and 16 (see Annex 1). Indeed, it is found that:

- The rate of compliance with the requirements relating to Chapter 04 is evaluated at 39.88%. This rate is very significant and shows that our understanding of the needs and expectations of interested parties in environmental matters is far from being mastered.

- The rate of compliance with the requirements of chapter 05 is evaluated at 45.56%. The CBS does not have an environmental policy and the resources required for the environmental management system are partially available.

- The rate of compliance with the requirements of chapter 06 is evaluated at 33.02%. This is due to the fact that the CBS does not have clear environmental objectives and therefore does not have planned actions to achieve them.

- The rate of compliance with the requirements of chapter 07 is estimated at 34.00%. This low rate is due to the lack of documented information for its environmental system and the necessary skills.

- The rate of compliance with the requirements of chapter 08 is evaluated at 12.34%. This rate is very significant given that the CBS is in a preparatory phase of diagnosis which will subsequently propose an action plan for the implementation of its EMS.

- The rate of compliance with the requirements Chapter 09 is evaluated at 20.81%. It is important to point out that the internal audits as well as the management review are partially carried out during 2020, as the CBS intends to change its QMS into an Integrated QSE system.

- The rate of compliance with the requirements of chapter 10 is evaluated at 18.39%. At present, the CBS does not have a record of environmental data or documented information.

In summary of the self-assessment on the degree of compliance with the requirements of ISO 14001:2015, the EMS of CBS has 28.91% compliance as shown in the figure below.

Thus, the rate of compliance with the requirements of the ISO 14001:2015 standard is evaluated at 28.91%. Indeed, the CBS has not carried out operational activities that meet the requirements of the ISO 14001 standard so it does not have the necessary resources to control its EMS.

Finally, we will present the results obtained during the self-assessment carried out according to ISO 45001:2018, as shown in Figures 18, 19, 20, 21, 22, 23 and 24 (see Annex 1) are summarized as follows:

- The compliance rate against the requirements for Chapter 04 is assessed at 55.77%. It is clear that the CBS does not have an Occupational Health and Safety management system. It only applies good safety practices to the Laboratories.

- The rate of compliance with the requirements of chapter 05 is evaluated at 14.51%. Particular attention should be paid to the participation and consultation of workers in OHS matters, as well as a clear definition of an OHS policy.

- The rate of compliance with the requirements of chapter 06 is evaluated at 09.35%. This low rate is due to the fact that the SBC has no identified objectives related to OHS and therefore no planning to achieve these objectives. Moreover, the CBS has not identified the hazards.

- The compliance rate with the requirements of Chapter 07 is estimated at 15.47%. The SBC must develop documented information for its OHS system, and good communication and awareness around OHS at the SBC is strongly required.
- The rate of compliance with the requirements of Chapter 08 is estimated at 23.89%. This low rate is due to the non-existence of an OHS system at the SBC, which now has some good practices in workplace safety.

- The compliance rate with the requirements of Chapter 09 is estimated at 10.88%. Internal audits and a management review are strongly required to measure the degree of compliance after the implementation of an OHS system.

- The rate of compliance with the requirements of Chapter 10 is estimated at 04.50%. At present, the CBS does not have a record of OHS data or corrective actions in the true sense of the word.

In summary of the self-assessment as to the degree of compliance with the requirements of ISO 45001:2018, the CBS SMSST has 14.69% compliance as shown in the certificate (see Annex 3).

Thus, the rate of compliance with the requirements of the ISO 45001:2018 standard is evaluated at 14.69%. A large-scale project is awaiting us to remedy these gaps.

As for the three analytical parameters, which the CBS intends to carry out, we present you the result of self-assessment according to the standard ISO 17025:2017:

The overall compliance rate according to the requirements of ISO 17025:2017 45.45%.

It indicates an uncomfortable situation in which the CBS is in compliance with the accreditation requirements, particularly with regard to resource requirements which is estimated at 18.53, and therefore the need to initiate an action plan to address this gap.

In December 2021, and after a certification audit, the CBS is certified according to ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 for its research and development activities in biotechnology as well as its activities of valorization of research results and technology transfer.

5. Conclusion

Through the Quality Support Project "PAQCR2S", the "CBS" is committed to a continuous process of excellence to strengthen its influence in its scientific and socio-economic environment, both nationally and internationally, by developing partnerships with R&D institutions and boosting VRR and TT actions with companies.

This new managerial practice of the CBS has been reinforced by a certification of its quality management system QMS, in May 2017, and then of its Integrated QSE system, in December 2021, which has allowed it:
- To integrate the approach of the continuous improvement of its organizational system
- To develop a high rate of customer and partner satisfaction (economic and academic).
- Control occupational health and safety risks related to research and development activities in biotechnology
- To master important environmental aspects associated with research and development activities in the field of biotechnology
- Demonstrate on a regular basis the ability to provide reliable analytical results that meet customer requirements. It plans to accredit three analytical parameters by May 2022.
- To reinforce the credibility of analyses with the socio-economic world
- To develop quality research activities in Biotechnology.
- To reinforce the valorization and the technological transfer of the research results of the center
- To increase the financial resources necessary for the proper functioning of the center
- To improve qualitatively and quantitatively the output of the research in biotechnology.

Through the Quality Support Project "PAQCR2S", the "CBS" has reinforced its commitment to continuous improvement, focusing on excellence and strengthening its influence in the scientific and socio-economic environment. The CBS is certified according to ISO standards, which has allowed it to integrate new practices and address gaps in compliance. The CBS plans to accredit three analytical parameters by May 2022, and seeks to reinforce the credibility of its analyses with the socio-economic world. It aims to develop quality research activities, master important environmental aspects, and improve its performance in terms of output.
Appendix

Appendix 1: Compliance rates against normative requirements

Picture n°2: 9001:2015_Chapitre 4: Context of the Center

Picture n°3: 9001:2015_Chapitre 5: Leadership

Picture n°4: 9001:2015_Chapitre 6: Planification

Picture n°5: 9001:2015_Chapitre 7: Support

Picture n°6: 9001:2015_Chapitre 8: Realisation

Picture n°7: 9001:2015_Chapitre 9: Evaluation

Picture n°8: 9001:2015_Chapitre 10: Amélioration

Picture n°10: 14001:2015_C_Chapitre 4: Context of the Center

Picture n°11: 14001:2015_C_Chapitre 5: Leadership

Picture n°12: 14001:2015_C_Chapitre 6: Planification
Appendix 2: Five Tables Illustrating the Five General Objectives of the Reform Strategic Plan

<table>
<thead>
<tr>
<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Improve the preparation of future students for university studies</td>
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<tr>
<td>1.2</td>
<td>Adapting training to the needs of the community</td>
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<tr>
<td>1.3</td>
<td>Reinforcing the social and economic partnership with the university at all stages of training</td>
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<td>1.4</td>
<td>Improve the student training and evaluation system</td>
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<tr>
<td>1.5</td>
<td>Pushing private higher education reform toward higher quality</td>
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<tr>
<td>1.6</td>
<td>Standardize the training process / quality management system</td>
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<tr>
<td>1.7</td>
<td>Improve entrepreneurship education</td>
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<tr>
<td>1.8</td>
<td>Improve the professional dimension in university education</td>
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<tr>
<td>1.9</td>
<td>Develop training through scientific research</td>
</tr>
<tr>
<td>1.10</td>
<td>Dissemination of continuing education and certification qualification</td>
</tr>
<tr>
<td>1.11</td>
<td>Improve the professional integration of graduates</td>
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Table 1: Improving the quality of university education and the employability of graduates

<table>
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<tr>
<th>Sub-objective</th>
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<tbody>
<tr>
<td>2.1</td>
<td>Establish a national system of governance for scientific research</td>
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<td>2.2</td>
<td>Structuring and promoting research in the humanities and social sciences</td>
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<tr>
<td>2.3</td>
<td>Reinforcing research funding and infrastructure</td>
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<tr>
<td>2.4</td>
<td>Improving human resource management in research</td>
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<tr>
<td>2.5</td>
<td>Establish a quality management system in the field of research</td>
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<td>2.6</td>
<td>Develop a system for the exploitation of research results</td>
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Table 2: Encouraging research and innovation

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<tr>
<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>3.1</td>
<td>Promote good governance at all levels</td>
</tr>
<tr>
<td>3.2</td>
<td>Establish the independence of universities and higher education and scientific research institutions</td>
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<tr>
<td>3.3</td>
<td>Adopt a management system that improves performance at three levels (Ministry, University, Institution)</td>
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Table 3: Promoting Good Governance and Improving Resource Management Resources

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<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>4.1</td>
<td>Define a policy for the creation of universities and institutions</td>
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<tr>
<td>4.2</td>
<td>Develop a strategy of positive action for the universities of the interior regions</td>
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<tr>
<td>4.3</td>
<td>Consolidate the university in the regional development</td>
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<tr>
<td>4.4</td>
<td>Improve the impact of the university on its environment</td>
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<td>4.5</td>
<td>Development of university life</td>
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Table 4: Revision of the university map for a better regional balance

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<thead>
<tr>
<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>5.1</td>
<td>Institutionalization of teacher training</td>
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<tr>
<td>5.2</td>
<td>Promoting innovation in training</td>
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Table 5: Encouraging teacher training

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<tr>
<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>6.1</td>
<td>Enhance biodiversity and resistance to salinity, drought and pests: Valorize industrial and household waste and preserve the environment</td>
</tr>
<tr>
<td>1.2</td>
<td>Strengthening the partnership between industry and the center Development of biological alternatives to treat cancer, in particular</td>
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Table 6: Research and Renovation

<table>
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<tr>
<th>Sub-objective</th>
<th>Description</th>
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<tbody>
<tr>
<td>9.1</td>
<td>Supervision of doctoral theses, master’s theses and final course projects</td>
</tr>
<tr>
<td>3.2</td>
<td>Reinforcement of the center’s influence by increasing the number of scientific articles in indexed journals, patents,</td>
</tr>
<tr>
<td>1.3</td>
<td>Focus on an integrated quality system (ISO9001, ISO45001, ISO14001, ISO17025)</td>
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Table 7: Training and Technology Transfer

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<tr>
<th>Objectives</th>
<th>Indicators</th>
<th>Activities</th>
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<tbody>
<tr>
<td>Strengthening the influence of the center by increasing the number of scientific articles in indexed journals, patents, ...</td>
<td>Number of scientific articles in indexed journals, Number of patents</td>
<td>Motivate researchers by creating a favorable and encouraging work environment -Strengthening the system of preventive maintenance of scientific equipment -Strengthening of public procurement procedures</td>
</tr>
<tr>
<td>Strengthening of units specialized in technology transfer and valorization of research results</td>
<td>Number of agreements concluded between industrialists and the center</td>
<td>Strengthening of research for industrialists.</td>
</tr>
<tr>
<td>Establishing an integrated quality system, ISO 9001, ISO 45001, ISO 14001, ISO 17025</td>
<td>Number of technology platforms Number of specialized units</td>
<td>Provide the necessary credits</td>
</tr>
<tr>
<td>-Training of the center’s staff in quality</td>
<td>Number of certificates obtained by the center Number of approved tests</td>
<td>-Provide funds for equipment</td>
</tr>
</tbody>
</table>

Table 8: The most important activity-related indicators for the 2019-2022 Program Contract
Appendix 3: Two certificates awarded to CBS in 2017 and 2021 respectively.

ISO 9001:2015 certificate in the field of research and development activities and valorization of research results and technology transfer

QSE certificate in the field of research and development activities and valorization of research and transfer results

References


