



## Current State of Research and Innovation in Moroccan Universities

### Impact of the MIMIR project.

#### 1. Introduction

The Erasmus plus capacity building Project « Modernization of Institutional Management of Innovation and Research in the South neighborhood (MIMIR) » aims at the development of institutional capacities in research and innovation management in Morocco and Jordan. The project engages European, Moroccan and Jordanian institutions of higher learning in a structured dialogue on the transfer and application of European best practices. Morocco is represented by Mohammed V University in Rabat (UM5R), Ibn Tofail University (UIT – Kenitra), Sultan Moulay Slimane University (USMS – Beni Mellal), Mundiapolis University (Casablanca) and the Directorate for Scientific Research and Innovation of the Ministry of Higher education (DRSI-MENFPESRS).

This report summarizes the current state of research and innovation management strategy at Mohammed V University In Rabat, underlining a number of opportunities and challenges regarding the MIMIR Recommendations.

#### 2. The existing research management strategy

##### 2.1. Short presentation of the Mohammed V University in Rabat

University Mohammed V in Rabat (UM5R) was created by his highness king Mohammed V bless his soul on December 27, 1957. It's the first modern university of Morocco.

UM5R contains 19 university establishment:

- 8 Faculties:
  - Faculty of Sciences (FS)
  - Faculty of Medicine and Pharmacy (FMP)
  - Faculty of Dental Medicine (FMD)
  - Faculty of Literature and Human Sciences (FLSH)
  - Faculty of Social, Economic and Law Sciences, Agdal (FSJES Agdal)
  - Faculty of Social, Economic and Law Sciences, Souissi (FSJES Souissi)
  - Faculty of Social, Economic and Law Sciences, Salé (FSJES Salé)
  - Faculty of Education Science (FSE)
- 3 Engineering Schools :
  - Ecole Mohammedia d'Ingénieurs (EMI),`
  - Ecole Normale Supérieure de l'Enseignement Technique (ENSET)
  - Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes (ENSIAS)
- 2 High Schools :



- Ecole Supérieure de Technologie de Salé
- Ecole Normale Supérieure de Takaddoum
- 5 research Institutes :
  - Institut Scientifique,
  - Institut des Etudes Hispano lusophones,
  - Institut Universitaire de la Recherche Scientifique,
  - Institut des Etudes Africaines,
  - Institut d'Etudes et de Recherches pour l'Arabisation.
- 1 satellite campus (Branch) in Abu-Dhabi.

UM5R count for more than 87 000 students with almost 4000 international students, 2034 research professors and 1350 technical and administrative staff.

Students are scattered around three campuses located in both cities Rabat and Salé. A new campus is under construction in the new city of Tamesna around 20 km from the capital city Rabat.

## 2.2. Structures and policies

Under Law 01-00 on the organization of higher education, universities are administered by a University Council. It deliberates on all matters related to the mission and functioning of the university and takes all necessary measures to improve university management. It also proposes education reforms and issues recommendations on teaching and learning. The University Council is assisted by a Management Council tasked with administrative and financial matters. University institutions are administered by Institution Councils that are placed under the supervision of the University Council. For operational matters, these councils set up specific committees such as the Scientific Committee which is responsible for faculty issues.

Policies are established by the Ministry of Higher Education. The rules and regulations are in accordance with the policies established by the parent ministry and are customized according to the governing board of each university.

Since the 2000 Reform, the University Council has moved from being a consultative body to becoming a true management body whose decisions are validated by the Supervisory Ministry.

The University Council distributes the government subsidy among the university institutions. Each institution prepares its own budget which is then submitted to the Institution Council for approval. The University Council approves the global University budget becomes effective once approved by the Ministry of Finance.

Law 01-00 invests the president and University Council, with the power to manage issues related to University finances, human resources and assets. The President is assisted by two Vice Presidents, one for Academic affairs and the other for Research, cooperation and innovation, and a General Secretary. In UM5R, the president appointed internally and in agreement with the University Council two other Vice-Presidents, one for the Governance and one for the information system.



### 2.3. Research Structure of UM5R

In 2017, the Council UM5R has approved the new norms of structure for research.

All living forces of our university took full conscience that UM5R would not be able to attend to its objectives of excellence and visibility without an unconditional adhesion and personal implication of research staff. In this spirit, UM5 has created 19 Centers of research that is consistent in plural disciplinary structures working in a precise domain. These centers have to be constituted of at least 54 permanent research professors regrouped under a form of laboratories. And/or a team and of at least 54 students pursuing Doctorate studies. Here below the list of these centers:

- 3 centers under FMP
  - Center of Biotechnological Medical and therapeutic Innovation
  - Center of Genome of Human Pathology
  - Center of Research of Medicinal Sciences
- 1 Center located in FSJES-Souissi
  - Center of interdisciplinary research in performance and competitiveness
- 1 Center located in ENSIAS
  - Rabat Information Technology Center
- 5 Centers located in FS
  - Water, Natural Resources, Environment and durable development
  - Science of Materials
  - Center of Mathematical Research and Applications of Rabat
  - Center of Energy Research
  - Vegetable, microbe, biodiversity and environmental Biotechnology.
- 2 Centers located in EMI
  - Engineering for smart & sustainable systems research center
  - Civil engineering, water, environmental, geosciences
- 3 Centers located in FLSH
  - Men, languages, civilizations and religions
  - Men, space and society
  - Languages literatures of arts et society
- 1 Center located in IS
  - Geophysics, Natural Patrimony and Green Chemistry
- 1 Center located in ENSET
  - Sciences et Technologies of engineering and health
- 1 Center located in FSJES-agdal
  - Strategic studies in laws of economics and management
- 1 Center located in FSE
  - Centre of interdisciplinary Science and education

Next to these 19 centers of research, are found 9 laboratories (each composed of at least 18



full time staff researchers) and 22 research teams (each composed of at least 7 full time instructor researchers)

Broken down into the following:

- Laboratory of engineering of tourism, patrimony, et development of durable territories
- Laboratory of condensed interdisciplinary sciences
- Laboratory of system conception
- Laboratory of research in law studies and economic studies
- Laboratories of finance entrepreneurial et development
- Laboratories of study and judicial research and politics
- Laboratory of biostatistics, clinical research and epidemiology
- Laboratory of history, space, society and culture
- Laboratory of linguistic research and terminology
- Research team of mechanical sciences and energy : models and experimentation  
Quality security maintenance
- Models of energy systems , of materials and mechanical structures and process industries
- Materials, energy and acoustics team
- Research teams in immuno-pathology
- Clinical Biochemistry , metabolic and molecular science
- Nutrition gastroenterology and metabolic diseases
- Research teams in cytogenetics and cellular culture
- Research teams of technical radiotherapy,
- Advancements in therapeutic research and quality of life
- Research teams in translational oncology
- Research teams of psychiatry, medical psychology and history of medicine
- Research teams of exploration of functional respiratory sciences
- Physics of high energy- models and simulation
- Informatics, applied mathematics, artificial intelligence and forms recognition
- Algorithms, networks, intelligent systems and software engineering
- Intelligent processing and security of systems
- Material Science and Radiation Team
- Governance of Africa and the Middle-east
- Interdisciplinary research team on Africa
- Research team of African politics
- Pluridisciplinary team of investigation of the Hispanic world and lusofono
- Research team of physiology of the exercise and autonomous nervous system

#### 2.4. PhD School or Doctoral School

Reform of doctoral studies in vigorous entry of 2008 with the publication of a **decree** announcing the rules studies of doctorate in the Centers of Doctoral Studies (Cedocs) and



constituents list of pedagogical national norms on doctoral cycles. UM5R contains nine centers of accredited doctoral studies covering the following disciplines:

- Sciences of Life Vie and Health (FMPh)
- Men and Space in the Mediterranean world (FLSH)
- Men – Society – Education (FSE) : FSE-IEA- IERA
- Law and Economics (FSJES –Agdal)
- Law and Economics (FSJES – Souissi)
- Compared Law, Applied Economics and Durable Development (FSJES – Salé)
- Sciences and Techniques of engineering (EMI) :EMI-EST- ENIM
- Sciences and Technologies (FS) : FS-ENS- IS
- Sciences and Technologies of Information and engineering (ENSIAS) : ENSIAS-ENSET

## 2.5. Research and Innovation

### 2.5.1. Publications

The University Mohamed V has generated hundred of publications each year from 2012 to 2017. It is ranked first place on the national level with almost 26% of all indexed Moroccan publications.

Year	SCOPUS	THOMSON
2012	990	520
2013	1021	456
2014	1311	728
2015	1358	1012
2016	1638	1192
2017	1769	1186

### 2.5.2. Patents

The University Mohammed V, home to many researchers, impose itself as an essential link in a chain of actors that promote research and innovation at regional and national level. Its mission is to stimulate innovation from the results of academic research obtained alone or in collaboration with companies.

For Intellectual Property, an officer is in charge to Identify and support registering patent, trademark, and copyright, Develop and maintain office forms such as Disclosure and licensing agreements, Support IP licensing and follow up on annuity deadlines, Maintain legal documentation for patent and trademark applications. He was being trained by the Moroccan Office of Industrial and Commercial Property (OMPIC)

The number of national patent filings amounted to 53 patents for the year 2016. With this figure our university was ranked number one in Morocco. Since 2010, the total number of patents is 182 :



- EMI : 27,
- ENSET : 37,
- ENSIAS : 58,
- FMD : 12,
- FMP : 26,
- FS : 21,
- FSJES Souissi : 4.

### 2.5.3. Innovation City (Scientific park)

The University Mohammed V has signed a partnership agreement with the Ministry of Industry (MCINT) and its ministry for the construction of a City of Innovation in Rabat (CIR), a major project for the new university. CIR houses a technological hosting infrastructure that is in line with international standards and consists of a technological park including an incubator, an incubator of innovative companies, R & D centers, a technology transfer office and a space devoted to high-tech companies wishing to establish partnerships with UM5R.

### 2.5.4. Entrepreneurship Center

The development of an entrepreneurial culture in academic circles to enable certain elements of this population to play an active role in the creation of innovative enterprises based on the valorization of research results.

On January 2016, UM5R created the University Center for Entrepreneurship (CUE) of the UM5 on January 2016.

The CUE reports directly to the Vice President in charge of Research and Cooperation. Its mission is to lead the advancement of entrepreneurship education and practice through teaching, research and outreach initiatives.

The center is led by a Director (Professor) and a team of more than 15 multidisciplinary professors are involved in the organization and animation of the various activities and projects.

The mission of the center is:

- Develop entrepreneurial culture at UM5R and promote entrepreneurial spirit among students.
- Identify and value the different activities carried out, aimed at promoting entrepreneurship in the various establishments, under the UM5R.
- Creating synergies within the university by encouraging the collaboration of researchers from a wide range of disciplines around projects related to entrepreneurship (studies, research, scientific events) for a stronger collective dynamics and greater visibility Programs and actions of the UM5R in training and research in entrepreneurship.
- Pooling resources, expertise and know-how to develop research and entrepreneurial actions.



- Coordinate actions with UM5R research structures to develop scientific and technical, theoretical and applied research in the field of entrepreneurship and innovation at the UM5R.
- Coordinate with innovation units to enhance inventions and innovations by incorporating them into an entrepreneurial logic.
- Encourage research in entrepreneurship at the UM5R, support young researchers, disseminate research advances and promote work and interventions in the field of entrepreneurship (publications, books, guides and other publications aiming to position researchers 'UM5R Rabat, as a major player in the field of entrepreneurship and innovation.
- Strengthen the interpenetration of academic research with the business world through collaboration and ongoing dialogue.
- Collaborate with national government agencies, institutions and institutions in charge of promoting entrepreneurship, to implement projects and actions, favoring the development of students' entrepreneurial spirit at UM5R.
- Organizing events in entrepreneurship (Conferences, seminar, entrepreneurship forum, workshops (creativity, business modeling,)) Competitions Rallye, social business contest, undertaking in women entrepreneurs, Start up WE, Innova Project 2.0 ....

Con formato: Inglés (Estados Unidos)

### 2.5.5. E-learning center

The missions of this center are:

- In-service teacher training in ICT and distance learning;
- Supervision of teachers in the production, co-production or adaptation of online content and activities;
- Organization and management of distance learning for the benefit of learners
- Dissemination of knowledge and skills in the socio-economic environment of the university.

### 3. Impact of MIMIR Project and challenges on Research and Innovation management at UM5R

Despite all the actions, Mohammed V University has taken to develop research, development and innovation and to strengthen the link between research institutions and industry over the last few decades. The results remain unsatisfactory. It remains to improve and reinforce some key actions like the EU centers visited.

In KU Leuven, research & development advances the impact of research results on people's lives like Secure smartphones, PCs, online banking apps and internet infrastructure, collaboration with Samsonite (results in lighter, the world's first patient-specific lower jawstronger suitcases) and the creation of Bakala Academy.



In Barcelona, created by the university, the Scientific Park promotes research, knowledge transfer and innovation, through smart management of spaces, services and relationships. So, it dynamisms highly talented researchers, entrepreneurs and business people, in order to lead and accelerate the innovation. The Scientific Park is geared to be a flexible and innovative organization, service oriented and focused on the customers.

After all the study tours, it is clear that the current governance structures at UM5R need to be reinforce to be able to support better research and innovation activities. The financing and financial management of research and innovation need to be more flexible.

### 3.1. Innovation and Research Project Management Office

Currently, the existing office reports to the Vice president for Research, Cooperation and Innovation. The main mission of this office is to provide an end-to-end support for the management and administration of Innovation and Research projects.

The UM5R is then faced to following challenges:

- The staff office provide very well assistance for project administration and follow up. But unfortunately, the administrative staff is not very competent for helping for technical writing. Expert teachers in project editing can train them. These expert teachers often help all colleagues.
- To implement a full course of training set of courses that cover basic skills needed for managing innovation and research projects. Colleagues from the University Center for Entrepreneurship (CUE) or from faculties can be very useful.
- To encourage the pooling of resources (sharing and synergy) and the development of multidisciplinary collaborations between all research structures. In 2017, the university underwent a restructuring of the research teams around thematic themes calling for a multidisciplinary and I&R project consortium. The various visits to Barcelona, Leven and Rome have shown us the usefulness of having multidisciplinary consortiums around specific themes.
- To develop the culture of recognition of the research function and the work done by the researcher, manager, technician, administrative agent, etc. ;
- To encourage applied research programs that will enable the development of a hard core around national technology to catalyze the country's economic activities and increase their share of value-added;
- To put in place mechanisms for the mobility of research actors (researchers, researchers, engineers, doctors, managers, etc.) etween universities, institutes and the socio-economic world;
- To develop research and innovation strategies and activities in relevance to funding ad market needs;
- To ensure that programs are accompanied by greater involvement of economic and social actors;
- To disseminate open funding opportunities from private, public and international partners. All the research structure receives an e-mail. TTO can be also very useful





- To have regulations that protect researchers' rights with patents – contracts between university and researcher;
- To intensify the transfer of know-how to meet specific training, research and innovation needs;
- To present periodical reports on office activities
- To create a Technical Transfer Office (TTO) at the university level. To improve the impact of the I&R project, TTO will match project goals and meet industry or business. So, TTO will build a bridge between industry and academia and boost productive research transfer. It is very helpful to define the role, activities typology and organizational models of TTO. It also highlighted the criteria of a successful TTO depending on the national and Institutional R&D environment from which: (i) laws and regulations to encourage researchers and universities to produce good and transferable research and technologies, and companies to embark in technology transfer from public universities; (ii) paradigm change within universities towards results-based management approach using the qualified competencies and appropriate means; (iii) a critical mass of research and technology transferable results to ensure sustainability and development of the TTO.

### ***3.2. The financing and financial management of research and innovation.***

The process to fund grants at Moroccan public universities needs to be shortened. UM5R is therefore confronted with this problem There is a need to:

- modernize existing financial instruments to combine flexibility and efficiency;
- reduce and relax procedures for the financial management of research budgets;
- give autonomy to the department or entity that manages the development of the innovation and its commercialization. The innovation city (scientific park) has been created but has still not been able to obtain the status of foundation to have separate administration and so, a financial autonomy. The TTO can then be domiciled in this city of innovation;
- Set up incentive financial systems for researchers to create spinoff and startup.

### ***3.3. The strengthening of human resources and the improvement of their mobilization.***

Human resource has become a crucial factor in the public-sector performance. It is an active and dynamic resource. In order to realize its full participation in the organizational goals and objective accomplishment, it needs to be trained developed and properly supervised.

There is a need to :

- make the profession of researcher attractive and encourage young talents;
- develop the culture of recognition of the research function and the work done by the researcher, manager, technician, administrative agent, etc. ;
- increase the number of administrative staff which is small relative to the size of the university;



- reinforce entrepreneurial culture in academic circles to enable this population to play an active role in the creation of innovative enterprises based on the valorization of research results;
- develop more transversal training at the level of doctoral schools.

#### **3.4. National and international cooperation**

The university has a very large number of agreements and collaborative projects at national and international level. But it will be important to develop an IT support Platform like proposed by stakeholders in MiMIR project. An IT Platform with software that will serve as a media for information sharing between different academic institutes among the same country, different academic institutes among different countries, and various parties among the same country (i.e. industry, research institutes, and government), allowing accessibility of information anytime, anywhere, any device. First it should be able to serve as a centralized information bank by getting researchers bibliographical information and share with other potential collaboration parties.

Currently UM5R has a website for researchers to create their personnel website: <http://scholar.um5.ac.ma/>

But the problem that arises in general is how to encourage researchers to fill in the site their data.