



DESCRIPTION OF THE PROJECT

1 DESCRIPTION

1.1 LOCATION(S) OF THE PROJECT ACTIVITIES

The focus of the programme is on the mobility of student-engineers in all the Mediterranean countries. In the initial phase, the programme more specifically concerns the regions/countries that are eligible under the terms of the Neighbourhood Programme: Morocco (Tetouan), Tunisia (Nabeul, Sfax), Egypt (Alexandria), Palestine (Nablus), Italy (Lazio and Campania), France (PACA and Languedoc-Roussillon) and Spain (Valencia). For the first part of the project, meetings will be held in these countries, whereas the application of the programme will concern all the countries that are partners in it, with among other actions the effective achievement of mobility validated by the degree supplement entitled "Mediterranean Sustainable Development Engineer". Among others, meetings are planned in Nablus (enterprise needs), Naples (entrepreneurship), Sfax (sustainable development).

South-North and North-South mobility will be achieved within companies concerned by these Regions. Particular emphasis will be given to the achievement of this mobility in Regions that are official partners in the Programme.

In parallel, this experiment will provide a basis for opening up this programme, validating competencies specific to the Mediterranean, innovation and sustainable development, to all the 53 member institutions of the RMEI and to other organisations that may join the network during the upcoming two years. Several universities outside the eligible regions have already expressed interest and wish to take part in a second circle of institutions that will be observers and later participants. This second circle will include in particular Moroccan institutions located on the Atlantic coast, Turkey (Istanbul Technical University) and Portugal (Coimbra). This will favour the dissemination and the sustainability of results.

1.2 OBJECTIVES

Observations:

Despite the numerous systems for providing grants and scholarships offered by various organisations, it should be noted that the mobility and the employability of student-engineers are not a strong point in Mediterranean establishments. To date, the solutions proposed strictly within the terms of bilateral agreements have suffered from certain limitations and have not sufficiently taken account of the needs and expectations of the southern Mediterranean countries. The results recorded for mobility in particular at Master level are far from meeting the qualitative and quantitative requirements.

Theme adopted:

A fresh start is required in order to provide a new approach to South-North and North-South mobility with a view to enhancing the employment potential of young engineers, in particular from the southern Mediterranean countries, and giving them a sense of pride in belonging to the territories in which or for which they will end up working. This new approach should be based on a close partnership with the world of industry and with the local authorities.

The theme is the validation of the Mediterranean engineer of the 21st century, in the context of a reduction of the heterogeneity of higher education between neighbouring countries and of mutual recognition throughout the Mediterranean.



It may appear incongruous to talk of a "Mediterranean engineer", since an engineer should be first and foremost a good technician equipped with scientific and technological knowledge, and this is not specific to any one region of the world. Nevertheless, it is necessary that the Mediterranean engineer should feel a positive sense of identity in comparison with North American or North European engineers, and the competencies that he will be able to acquire in the course of this programme should aim to give him the desire to play a major role in the economic and social development of the Mediterranean.

Aims:

Every new engineer should:

- Possess a good standard of scientific knowledge, attested by the award of a Master's degree in engineering science or equivalent by the partner establishment.
- Master the broad concepts of sustainable development.
- Demonstrate a good knowledge of the culture of at least one other Mediterranean country, evidenced by, for example, the validation of a long stay abroad.
- Have hands-on knowledge of the world of industry through having undertaken at least one work placement in a country on the other side of the Mediterranean.
- Be trained for innovation and entrepreneurship through his or her personal experience.
- Be aware of the social repercussions of his work as an engineer.

The aim of this programme is to define in a precise, quantifiable and verifiable way the competencies required as a basis for awarding an official certificate of Mediterranean Sustainable Development Engineer. The award of this certificate should provide a strong incentive for student-engineers and be seen as a guarantee of quality by companies.

Specific quantitative aims:

The programme will concern for the first experimental phase 30 students from southern Mediterranean countries who will have the opportunity to carry out at least one mobility placement in companies in a northern Mediterranean country, and ten students from northern Mediterranean countries who will carry out a placement of at least three months in a company or university laboratory in a southern Mediterranean country.

In order to achieve these aims, in each partner establishment a unit dedicated to this mobility programme should be set up, and coordination with companies should be institutionalised on the basis of the Med Europe Intern Programme developed by UPE 13 in partnership with the RMEI, and with the partner local authorities. **Each student-engineer will be supervised throughout the programme by an individual tutor.**

2 RELEVANCE OF THE PROJECT

Our approach, supported by UNESCO within the framework of Chair 651 "Innovation and Sustainable Development", is based on the following requirements:

- In November 2008, UNESCO reminded higher education establishments of their responsibility regarding the aid to be provided for students "in order that they may acquire ethical values and attitudes which will make them responsible towards society and more aware of realities at local, national and worldwide level".
- The training of engineers calls for regular review in a world facing uncertainties regarding its future and transformed by information technologies and by the expansion and interfacing of knowledge.

- At the outset of the 21st century, the engineer is increasingly required to shoulder new and urgent responsibilities linked to the major problems that are facing society. Recently Fadia Kiwan (University of Saint Joseph, Beirut, Conference on Higher Education, Unesco, July 2009) insisted on the importance of the social sciences in the training of students, pointing out that globalisation has added new urgency to the need to develop solidarity between peoples.
- The pursuit of efficiency in making the transition from knowledge acquired to "*savoir faire*" (know-how), to "*savoir être*" (knowing how to live) and "*savoir vivre ensemble*" (knowing how to live together)(Jacques Delors, in "Education : un trésor est caché dedans", 1996) calls for the acquisition of new competencies : knowing how to work in a group and to communicate in a multi-national environment, mastering sciences and techniques but also knowing how to define a problem in all its industrial, economic and societal complexity in order to be able to solve it.

Today, the engineer is, from the outset of his or her career, confronted with or indeed supported by globalisation. This raises the question of the role of the engineer in a world where the advances made by society should be underpinned by knowledge-based innovation.

The Mediterranean Sustainable Development Engineer: hope for the future or utopia.

The Euro-Mediterranean project, which the RMEI is striving for and which is increasingly a priority for politicians and business leaders, will be developed on the basis of projects. The Mediterranean Engineer will be called on to become an active partner in the revitalising of society, capable of dealing with the major challenges facing the Mediterranean region. He must feel a sense of pride in working within or for this region of the world, and not be tempted to join the brain drain. This ambition to entrust to engineers major projects is vital if the Mediterranean region is to prosper and become a reference in terms of the economy, the environment and society and as a haven of peace. The task of educators is a difficult one and the education of student-engineers should be a political priority.

The aim of educators is to ensure that students may have the opportunity to end up at the head of leading companies and that, in the short term, they may be in phase with market requirements, with strong employment potential. This engineer of the future should be immediately operational upon graduation, which means he or she should be capable of adapting to new situations and new working environments, and be able to lead a multicultural team. Given the relatively short duration of the first degree course, students cannot today be expected to have acquired an encyclopaedic knowledge of their field of study. Educators should therefore identify the knowledge and competencies that need to be acquired in order to be capable of properly defining a complex problem and of seeking solutions on the basis of innovation, research and sustainable development.

Companies know how to recognise the personal scientific and technological competencies of engineers. They are particularly attentive to their leadership qualities, their aptitude for communication and for sharing information, their social awareness, their enthusiasm and of course their ability to manage a project and to lead a team. Open-mindedness and personal integrity, the refusal of privilege, respect for others and social responsibility are sought-after qualities. This training in sustainable development and ethics should be delivered in a day-to-day environment that shares these values.

In addition to knowledge that will be attested by the award of a degree by the home institution, the specific competencies that the programme wishes to validate for each new engineer are as follows:

- **Mastery of the main concepts of sustainable development**

- **Good knowledge of the culture of at least one other Mediterranean country**
- **Good knowledge of the world of industry**
- **An enterprising mindset (intrapreneurship or entrepreneurship)**
- **Capacity for innovation**

The priority and ultimate target group is student-engineers. Other target groups include:

- Managers of work placement and mobility programmes in universities
- Local authorities that seek to encourage student mobility and where there is a demand for specific knowledge linked to territorial needs.
- Companies that recruit engineers and which in the initial phase need to familiarise them with the world of industry (placements and lectures).

For this programme, the aim of which is to meet the requirements and needs of southern Mediterranean countries, and for which it is intended to organise a practical application of these principles on an experimental population, it is planned to associate 30 student-engineers from southern Mediterranean countries and 10 student-engineers from northern Mediterranean countries. Each student will be supported by a sponsor.

In order to determine the requirements of the territories, companies, universities and students, groups will be organised in parallel, from the end of the first month, with the responsibility for:

- Identifying the causes of limitations of student mobility
- Identifying the needs of companies and the possibilities for student placements
- Identifying the competencies required in order that a young engineer will have received proper training in sustainable development, innovation and entrepreneurship.

It will be ensured that each group will include at least one representative of the social sciences in order to cover the additional training that is today indispensable if the engineer is to be properly equipped to serve both industry and society. The groups will make available the means required to collect as much data as possible (questionnaires, interviews, current state of play surveys) and should meet at least once at the end of Operation 1 in order to draft and to approve the document that will be submitted for Operation 2.

Education and Mobility in the Mediterranean.

Examples of student mobility do exist, but:

- The mobility programmes seen as successful generally concern mobility for PhD students, who carry out their doctoral research in a university laboratory in a northern Mediterranean country, the most positive but as yet relatively rare model being that of co-supervision of doctoral theses. PhD graduates from these programmes who are then recruited by companies to work in a job with a link to their home country are rare.
- Mobility programmes do not impose sufficiently high standards with regard to students. The same is true of standards regarding the functioning of universities and being attentive to the needs of companies and local authorities and providing follow-up.
- It is a mistake to consider that the only restriction on student mobility is the availability of grants and scholarships and / or the amount offered. This does not reflect the reality, which is rather linked to the reluctance of universities to provide proper academic supervision of students and to the brain drain, and to a failure to take sufficiently into account the requirements of universities with regard to companies, which are sometimes put off by the administrative obstacles. With regard to the local authorities, it is to be wished that they may play a more active role in relation to mobility programmes, and to go beyond a role as simple providers of grants.

- For students, there is a risk that mobility may become little more than academic tourism, the lack of motivation resulting perhaps from the failure to provide a proper perspective, which should be associated with proper control and validation of the process.
- Some mobility programmes developed within the framework of the ERASMUS- MUNDUS programmes are of high quality but only concern a limited number of students.

There have been recent initiatives aimed at promoting the Euro-Mediterranean project (Paris Summit, July 2008), but the Mediterranean region is not really a priority for European higher education, which focuses more readily on the BRIC countries (Brazil, Russia, India, China). Where there have been successful cases, they have resulted from bilateral agreements (one northern Mediterranean country / one southern Mediterranean country), without any coordination between northern Mediterranean countries or between southern Mediterranean countries. Very often, the process has been proposed by northern Mediterranean countries without taking into account the needs of the southern Mediterranean countries. The association of local authorities, industrial confederations and universities is a guarantee of progress with regard to the challenges of mobility and engineering training.

The Engineer, innovation and the knowledge society

Today, in a global and ever more competitive economy, innovation is a key element of competitiveness and is increasingly recognised as such. Modern economic systems, dynamic companies, territories and countries need a better understanding of innovation management. This calls for entrepreneurs and managers capable of developing expertise in the discovery, development and marketing of new products and processes.

Only a small part of technological potential leads to the creation of wealth, to the improvement of health and to job creation. Less than 50% of companies survive beyond the first five years of existence, more than 74% of young entrepreneurs have difficulty in making a success of their innovations and 80% of SMEs have difficulty finding the capital needed to introduce innovations onto the market, although capital is available and in sufficient amounts. During the fifth Euro-Mediterranean Conference at Caserta (Italy) on October 4 2004, the industry ministers approved a work programme on industrial cooperation for 2005-2006. In particular, it was recognised that the entrepreneurial spirit represents an important motor to drive economic growth, to generate revenues and well-being and therefore progress for everyone in a Euro-Mediterranean region that aims to become a free trade zone.

A new policy on mobility is required

The system proposed is in phase with the full range of initiatives undertaken by the local authorities, industry and universities while providing a degree of coherence that, if successfully applied, would be a real breakthrough and trigger a more dynamic policy for mobility and for improved mutual knowledge between students from the various Mediterranean territories.

This project aims to provide a fresh start with regard to the classic mobility model for students, on the basis of the following aspects:

- quantitatively, at Master's degree level: within the RMEI, more than 100 000 students are concerned.
- qualitatively, via a challenging coordinated track under the control and supervision of an individual sponsor
- in terms of high academic standards (individual supervision and assessment)
- in terms of sustainability by fixing ambitious objectives for all the Mediterranean countries
- in terms of employment potential in companies
- in terms of economic spin-offs for the Mediterranean region and its territories

3 METHODOLOGY

3.1 DESCRIPTION OF THE PROJECT AND ITS EFFECTIVENESS

The underlying principle behind this programme is the need to make a fresh start with regard to current approaches to mobility for student engineers in Mediterranean countries. Students have mixed feelings with regard to the necessity of taking part in mobility programmes, while for prospective employers it is an absolute necessity: to date, mobility cannot be considered as among the strong points of higher education in Mediterranean countries. What mobility there is concerns mainly PhD students from southern Mediterranean countries, who come to study in a northern Mediterranean country in which they subsequently seek employment or which serves as a springboard for leaving to work in another part of the world (USA, Canada).

All too often, the poor success rate of mobility programmes is seen on both sides of the Mediterranean as being the result of the insufficient number of grants or scholarships. This is not the main cause. There is often a lack of candidates for the grants offered by local authorities or the placements offered by companies, while students complain that they have no opportunity to get to know another culture. It is clear that there are a number of obstacles for South-North mobility, among them difficulties in obtaining visas or in finding accommodation for a duration of less than a full academic year.

Following an initiative by the organisation of business entrepreneurs of the Provence-Alpes-Côte d'Azur Region (UPE13), companies were encouraged to increase the number of student placements offered. The RMEI which is a partner in this programme seeks to encourage the development of a better balance between placement offers from companies and the demand from students through the actions of staff in the universities dedicated to that task. However, we are convinced that another complementary approach is required in order to achieve this link-up. This involves the enhanced perspective that this mobility should represent for the student. This process will in particular involve proper administrative and academic management of mobility programmes and also the identification of a new **logic** more in phase with the needs of the Mediterranean regions.

The aim of this project is to award a degree supplement entitled " Mediterranean Sustainable Development Engineer" to every student engineer who has met a certain number of requirements linked to the major challenges of sustainable development, innovation and entrepreneurship. The idea is to award a degree supplement in phase with the spirit of the Bologna process, the award of the master's degree in engineering (or equivalent) remaining under the sole responsibility of the student's home institution.

The **achievements** of the project will include, first and foremost, the working out of a consensus between the academic establishments, the local authorities and the business confederations, to define the minimum competencies that an engineer at the outset of his or her career should possess. In order to help the student engineer to meet these requirements, it will be necessary to define the structures required within each establishment to popularise the process (track including international mobility) among students and to help them with their own **activities**. An international **unit** should be permanently established in order to guarantee the validity of the process and a **numerical platform (website)** will in addition to displaying course offers provide the means to monitor graduates' careers. Finally, on an experimental basis, forty or so students will be selected for the programme so that they will be awarded the degree supplement at the end of the present project: they will include 30 students from southern Mediterranean countries and 10 students from northern Mediterranean countries.

During the project, the following documents will be drafted and published (internet, press, etc.):

- A note on the obstacles to mobility
- A note on the employment potential of young engineers and on the needs of industry in terms of competencies
- A note on the minimum knowledge and competencies that any young engineer should possess with regard to the challenges linked to sustainable development in the Mediterranean area
- A note related to the competencies and experience required with regard to the entrepreneurial spirit
- A note related to needs with regard to innovation. This particular aspect will be analysed in detail from the point of view of the needs of universities
- Outline of the means to obtain the degree supplement "**Mediterranean Sustainable Development Engineer**"
- A final document which will underline the bilan of the operation and which will be a report about the good practices, mainly for the internship approach.

A **numerical platform** will be developed for the purposes of monitoring students and to promoting the programme.

A feedback conference will be organised towards the middle of the first year before the launch of the actions focussed on organising appropriate structures within the universities. It will be attended by representatives of engineering higher education, of local authorities and industry.

A degree ceremony will be organised at the end of the project to award the first 40 degree supplements.

Operation 1: Identification of needs and obstacles

After the official launch of the programme, during a seminar where the broad competencies required for the training of a young Mediterranean engineer will be identified and approved, the Consortium will set up four groups, each responsible for an in-depth analysis of one of the various priorities.

Mobility Group MG

The aims of this group will be:

- to carry out a survey of mobility in master's level engineering courses: type of mobility, percentages, aims, priority destinations worldwide for outgoing mobility and origins of incoming student engineers in mobility, etc.
- to identify current obstacles to mobility, and to analyse these obstacles, beyond simple problems of funding, taking into account the approaches developed in each institution: fear of losing the best students for the research laboratories, difficulties of monitoring students abroad, wish that all students might benefit from mobility, course design that leaves little room for mobility, political choices, cultural choices, etc.
- to define the reasons why it is important for a student engineer to achieve successful mobility
- to situate mobility as a component of engineering higher education

The Group will then make specific proposals to ensure that the mobility might be considered as successful, that it will help a young engineer to be properly integrated into a company and not lead systematically to emigration and the loss of competencies for the student's home country.

The requirements of southern Mediterranean countries will be considered as a priority.

Employment Potential and the Needs of Industry Group EPNIG

The mission of this Group will be to identify the kinds of knowledge of industry that are essential for a young graduate in order to have good employment potential at the outset of his or her career and to analyse the means made available to enable the student to achieve **real hands-on experience of industry**. The MedEuroIntern portal will provide a basis for enhancing the links between companies and students at Mediterranean scale.

The Group should also define the range of knowledge of the world of industry that that should be provided to student engineers during their training.

The Group will be asked to define what would be the most suitable duration for a placement in an international context, and to specify the deliverable that the student should submit at the end of the placement. A range of sample tracks according to the career focus of students will be offered. They will be made available to students on a website.

It can already be stated that ways will be considered to enhance the student's oral and written communications skills, in a context of dialogue with experts from companies in northern Mediterranean countries – to know how to present and to "sell" a project is fundamental, as is the ability to be well-organised, to assimilate a broad range of information, to take decisions, to manage the projects they are responsible for, to develop a variety of relations with others, to know who knows rather than simply knowing, etc.

Sustainable Development Group SDG

On the basis of discussions within UNESCO on the definition of sustainable development and on education for sustainable development, and as part of the **Decade of the United Nations**, the Group will define the basic concepts that every student should master and the best way to acquire them. This group will include representatives of local authority and representatives of industry. It should focus its deliberations on the two-fold context of higher education and life-long learning.

Sustainable development, based on the three cornerstones that are the societal, economic and environmental priorities, will be analysed as a whole but also from the focus of viable development (environment, the economy), liveable development (environment, society) and equitable development (economy, society). It should be assimilated as a whole with all the **scope** necessary for an issue of such capital importance.

The theme of education for sustainable development is a priority that has been clearly declared within the RMEI. During the various workshops, seminars and exchanges of views and information, certain key points have been highlighted:

- The definition of sustainable development and its scope have considerably evolved over time: today we speak of sustainable campuses, sustainable companies, sustainable tourism, and so on, and while the environmental aspect remains, it should not be this alone that is taken into account. In particular, the application of sustainable development in the management of any university, and in particular of engineering schools, should be considered as an activity that is just as important as that of the teaching. It will make it possible to make substantial savings and will also serve to set a good example.
- A real difficulty lies in the concept of development that is associated with that of growth: this problem may perhaps be solved if the concept is associated mainly with the quality of life rather than with ever-increasing consumption.



- The statement by the Director General of UNESCO "We must act now, for afterwards it will be too late" raises the question for universities of how to act to ensure that it is not too late?
- Lines of approach for finding solutions must be proposed, and social development must be given priority over environmental questions.
- The question should be addressed of the possibility of creating jobs through sustainable development.
- Elected officials will feel all the more concerned by sustainable development once the number of business deciders who have been trained in sustainable development has reached a critical mass.

In the wake of the RMEI seminar on sustainable development held in Barcelona in February 2008, the following questions will be addressed by the Group:

- Is it feasible to encourage the people in charge of the various courses to adopt a trans-disciplinary approach? With what aims?
- In parallel, how can the administration of each university or school be persuaded to adopt a strategy for sustainable development as part of their own mode of functioning: the institution should set an example.
- How can each university / school organise the monitoring and assessment of this project?
- How to make operational a strategy for the promotion of sustainable development?
- How to develop and encourage an ongoing dialogue on the sustainable development process in order to identify the good practices.
- How to introduce a policy of communication within the RMEI, in particular regarding the development projects, their content, strategy and the first results achieved?
- How to organise the training of future "sustainable development leaders" from all the schools / universities who will be responsible for promoting a sustainable development policy within each institution?

The Group will also identify the themes specific to the Mediterranean which should be taken into account in the training programme. A non-exhaustive list might include the following:

- intelligent energy management
- the development of solar energy. The southern Mediterranean countries have a great need for renewable energy whereas certain projects presented recently involve producing solar energy in North Africa to meet the requirements of... the countries of Northern Europe!
- access to water and water treatment systems in the spirit of the *Union Méditerranéenne des Jeunes Ambassadeurs de l'Eau* (Mediterranean Union of Young Ambassadors for Water) that the RMEI is managing with the *Ambassade de l'Eau* and which has been submitted as a project to the *Union For the Mediterranean*
- recycling and valorisation of household and industrial waste
- building design in phase with local climate and of high energy efficiency
- urban public transport systems
- the war on pollution
- management of natural and industrial waste
- policy for safe transport of goods and passengers
- ...

Entrepreneurship, Innovation and Technology Transfer Group EITTG

On the basis of the procedures developed within the world economic forum and of initiatives from industry, the Group should make proposals for specific actions to enable students to become more aware of the entrepreneurial spirit. This will involve placing them in the two-fold context of entrepreneurship and intrapreneurship, although the aim would not be the setting up of a new company after graduation. The cultural obstacles such as fear of failure, that is so strong in Mediterranean culture, the lack of daring or determination, will be analysed in particular.

The construction of a society founded on entrepreneurship would involve all its citizens. A major role should however be played by the education system and the media, in such a way as to promote a positive attitude to entrepreneurship. The construction of such a society would require in-depth reforms of teaching based on new ways of thinking and on more active working methods in order to make the educational system more in phase with the needs of society. If universities need to become closer to society, the public authorities also need to develop networks that can help the universities to define, publicise and assess educational courses. It is important that this training should not be limited to students in business-related disciplines.

A strong entrepreneurial spirit and innovation management skills and knowledge are vital for the development of a knowledge-based economy. Accordingly, the training of student engineers should begin at undergraduate level and have a particular impact at master's level by means of courses and lectures on these themes of entrepreneurship and innovation management and of hands-on experience.

Knowledge-based innovation management is a new concept that merits particular consideration in the Mediterranean countries. The expert group should highlight the essential capacities required for innovation and to make innovation of benefit for the equitable development of the society. The project should include both training – with the organisation of seminars – for students but also for university staff.

It is very important that students be in contact with the realities of technology transfer and innovation. The development of a virtual business incubator and the constitution of a network of business incubators in Mediterranean universities and regions will be undertaken in parallel with the survey of requirements regarding the acquisition of the basic competencies by the Mediterranean student engineer. Specific actions will be organised for the benefit of young researchers and master's students.

This aspect of "innovation- and technology transfer-related competencies" will require the development of specific structures in the framework of this project and this will be managed by the University of Naples Federico II.

Functioning of Groups

It will be ensured that each group will include at least one representative of the social sciences in order to take into account the additional training required today to guarantee that the engineer will be properly equipped to serve the interests of industry and society. Similarly, each type of partner will be represented in each of the 4 groups MG, EPNIG, SDG, EITTG.

The groups will mobilise the necessary means to collect as much information as possible (questionnaires, interviews, state of play surveys) and should meet at least once at the end of



this operation in order to draft and approve the document that will be submitted during a conference for Operation 2.

Operation 2: Definition and validation of required competencies

During these three months, and under the supervision of the local authorities, a contractual document drafted by the companies and the universities will define the minimum requirements for the award of the degree supplement, specifying the conditions of validation and will accordingly provide guidelines to the universities on ways to enable students to acquire these competencies.

At first, the Steering Committee will be the responsible for the award of the degree supplement and the monitoring of the operation. This committee should include representatives of the 3 groups of partners (local authorities, industry and engineering higher education) and be representative of various Mediterranean countries concerned, with strong representation of the southern Mediterranean countries. This Steering Committee should provide clear rules for the programme that will provide a basis for its sustainability over time.

Operation 3 : Structure-building in partner universities

Operation 3-1: Internal organisation and training of trainers. On the basis of the guidelines provided under Operation 2, universities should make available the necessary means to make a success of the programme. This will involve identifying the right people to take charge of the programme, encouraging communication and valorisation targeting the whole student body, adapting the existing courses and developing new courses if necessary.

Although the experimental process proposed in Operation 4 will only a priori concern about forty student engineers, that is students registering for the whole process proposed, our intention is to enable the greatest possible number of students to benefit from the conclusions and guidelines formulated under Operation 2. A particular effort will therefore be made to put to the best possible use modern communication technologies and to make the information easily accessible to all the students. The RMEI will take the responsibility for the development of the **communication technology platform** open to all the students

The RMEI will be at the disposal of all the universities of the consortium on demand to identify to assist in identifying and making available the required human and material resources.

Operation 3-2: Numerical Platform. The relevance of the project with regard to the needs and constraints identified under Operation 2 depends on the setting up of a collaborative network of experts with the active participation of the target countries and group(s) concerned via a joint website and flexible distance learning system, adaptable according to requirements and availabilities, and consolidated by web seminars, etc. This tool will make it possible to save on costs of training students who will thus be able to enhance their knowledge and personal and/or professional skills in relation with the mobility and with the requirements of the degree supplement.

This is an innovative tool and its development is fully in phase with current initiatives, policies and strategies for the Euro-Mediterranean zone and with the processes of Bologna and Lisbon in the spirit of life-long learning and e-learning platforms.

This joint website will be developed with the active participation of the academic staff, professionals and experts for the course design, monitoring, training, etc., for the purposes of higher education students, professional conversion, continuing education or personal



enrichment of knowledge in the context of constant and rapid technological mutation in which we live.

This tool will be the first stage towards apprehending and making good the gaps in the transmission of knowledge that is "necessary because of the technological evolution that is increasingly present in everyday life and increasingly rapid as the result of globalisation .." between groups of people, etc. This joint network will thus provide access for student engineers and for young engineers to the knowledge and competencies that have been pre-determined to equip them to be capable of clearly formulating a complex problem and knowing how to undertake the process of seeking a solution on the basis of innovation, research and development. This phase will continue until the end of the programme.

Operation 4 : experimentation

The programme will be tested on forty or so students (30 from southern Mediterranean countries, 10 from northern Mediterranean countries). This trial-run will conclude with the official award of the degree supplement during a ceremony that will be organised in such a way as to provide clear evidence of the intention to disseminate and promote this new product.

Each university will put forward master's level student engineers as candidates and the Steering Committee will select the forty or so students who can present the most structured and coherent career plan. Each student engineer will then be supervised by a non-academic tutor whom he or she will meet at regular intervals for a progress report. These tutors will be chosen from business people from countries throughout the Mediterranean. This tutor will not replace the academic tutor designated by the ad hoc mobility unit in each establishment.

With regard to mobility, logistical and material support will be provided on a one off basis because of the experimental nature of the first student class. The acquisition of competencies will be achieved locally or during the mobility but above all, students will have at their disposal the joint website which will enable them to prepare for the mobility and to clearly identify the broader priorities of the mobility beyond scientific or technological theme of the placement.

Throughout this operation, the publicising of the experiment and the communication targeting the student engineers of the following year groups will be undertaken under the responsibility of the RMEI in agreement with the Steering Committee for the programme.

General management

The RMEI will chair a Steering Committee consisting of seven members which will be responsible for coordination between the five competencies groups. It will undertake to organise the launch meeting and the first seminar to provide an overview for the Groups. It will publish at the end of each operation a document for companies and local authorities to provide progress reports and feedback on any specific difficulties encountered. It will be responsible for organising the closing ceremony.

The Steering Committee for the programme should seek to identify all good practices, ensure that they are circulated within the consortium and take measures to ensure the extension of the programme to universities that were not members of the original consortium. The Steering Committee will represent the regions concerned by the programme and the various partners (university, business and political).



Each group will be made up of representatives of the regions and partners. It can call on international experts as required. The working documents will be progressively made available on a dedicated website as the programme proceeds.

At regular intervals, the RMEI will communicate to all the partners a financial report and progress report.

The principle of a fresh start, clearly announced as the necessary basis for making a success of the project, will depend first of all on taking into account the various constraints, whether internal to the university or external. The first stage of this project, that is of capital importance with regard to what follows, is thus to identify the problems which will require being attentive to the views of the various partners (student engineers, universities, companies, local authorities) and drawing conclusions that will be acceptable to all and which will take into account local cultural specificities. We must be aware that underlying any measure to promote mobility there is the risk of expatriation: a major priority therefore is to combat this risk of a "talent drain" without blocking the mobility which is considered necessary. This can only be achieved through well-planned procedures managed by those who are in a position to prevent this talent drain that is the local authorities and the companies. The success of specific actions involving face-to-face or distance training such as those planned for innovation and technology transfer will be a guarantee for the young engineer of the personal and professional fulfilment he can expect to achieve in his own country.

A well-managed and demanding mobility programme is a means of dialogue with students to respond to the numerous doubts and uncertainties they face, in particular at the outset of their career. Knowledge of the world of industry through properly supervised and planned placements will also provide vital input with regard to this essential knowledge. The consortium is representative of the major economic and cultural priorities of the Mediterranean region and this factor is for us a guarantee of spirit of openness towards the outside world and in particular towards the needs of the southern Mediterranean countries. Via the ad hoc units set up within the universities and on the basis of the external partner organisations of the RMEI (Black Sea, Brazil, Russia), comparisons will be made with regard to other regions of the world.

The aims of the first operation of the programme will include identifying as far as possible the external constraints and providing as objective a survey as possible of the various actions related to mobility, to training in sustainable development, to encouraging a spirit of entrepreneurship and enhancing employment potential. This will involve giving pride of place to all the Mediterranean cultural values that intervene in choices made by students on a day to day basis.

The major constraints to be analysed may be summarised as follows:

- The difficulty of clearly understanding the requirements of southern Mediterranean countries
- South-North mobility that serves to make good the lack of candidates for PhDs in European countries
- The lack of proper links between the southern Mediterranean countries
- The absence of a proper European policy regarding academic relations with southern Mediterranean countries and territories
- The tensions between certain Mediterranean countries
- The lack of a universally agreed definition of sustainable development



- Administrative difficulties regarding mobility
- Insufficient attention paid to humanities and social sciences based input in engineering training
- ...

It is clear that our consortium does not have the means to solve all these problems, but the challenge that we wish to take up is that the drafting of consensus-based documents during Operation 1 will be a guarantee of progress and success in terms of establishing clear guidelines. During Operation 3, it will be essential to take into account local situations as a basis for setting up mobility supervisory units even if the guidelines drafted in Operation 2 should remain applicable to all partners. During the experimental phase relative to Operation 4, the individual tutor will remain in direct contact with the student in order to identify on a day to day basis the difficulties encountered and to seek suitable solutions with the support of the three partner groups (local authorities, companies and universities). The joint website will also be a tool to be used for supervising students.

3.2 IMPLEMENTATION OF THE PROJECT

The method of implementation reflects the aim to place the project within the logic of a fresh start. The project will not therefore focus on supporting and developing existing mobility programmes but rather on designing a new framework. It is for this reason that our initial aim has been to identify a priori the competencies that we wish to see mastered by each new Mediterranean engineer, which will require in-depth and reasoned examination within the four Work Groups whose work will be coordinated by the Steering Committee.

Sharing the conclusions among all the partners will be an indispensable step in the progress of the project. Similarly, the step involving developing proper organisation for the process within each partner university will be primordial for establishing a sustainable basis for the success of the award of the degree supplement.

Although it is to be expected that this work and the organisation process will be of high quality, ..), we intend to test our procedures on forty or so student engineers before making it official and offering it to the Mediterranean area engineering higher education community as a whole.

The implementation of the project on the basis of the four operations planned reflects this desire for innovation and for ensuring that mobility will be in phase with the needs of the Mediterranean countries. The joint website is an essential tool for limiting the costs of mobility and of the complementary training and to facilitate the day-to-day monitoring of student engineers in their mobility projects.

In addition to the target group that is the student engineers, the partners in the project come under three categories:

- Universities
- Local authorities
- Industry

These three types of partner all have a major role to play, respectively in the definition of academic requirements, the interest for the territories and their neighbours and in the needs of industry. It should however be noted that they will work in synergy within all the work groups.



Colleagues who are specialists in the humanities and social sciences have already given their agreement to work as consultants during discussions of the competencies required. Other specialists with recognised expertise in sustainable development, innovation and technology transfer, the recruiting of engineers and ethics will also be associated.

In addition, through the RMEI network, other establishments and institutions concerned by mobility but which are not eligible for the programme will be regularly kept informed of the progress of the project. Within this second circle, engineering schools and universities have already been identified in Morocco, Portugal and Turkey.

On a very practical level, the RMEI will undertake the leadership of the programme and its dissemination as well being responsible for its sustainability. The regular meetings organised by the RMEI for its members will provide an ideal opportunity for communication and dissemination.

The universities will designate representatives within the various work groups and will participate in the workshops organised for the kick-off meeting, the feedback and coordination sessions and the closing ceremony. They should circulate the information within the university and identify the students interested in the implementation of Operation 4. They will be responsible for setting up an internal monitoring structure for the programme and will be able to organise conferences aimed at demonstrating the interest and the effectiveness of this approach.

The local authorities will provide the societal and economic guarantees of the interest of programme. They will designate a representative for the various workshops and seminars and will take part after discussion and coordination with other local authorities in the various work groups. They will also be called on to provide support for the reception of students in their regions. As pointed out by Mr Luciano Carrino (speech during the conference on territoriality, Marseille 2007), it is regrettable and harmful that the question of territoriality is not included in the training of engineers: this constitutes an important challenge.

The representatives of industry will be responsible for taking part in deciding on the competencies they would like young engineers to possess at the outset of their careers, and their involvement in the discussion groups will be of primordial importance. They will also be called on to offer student placements in phase with the aims of the programme and they may designate visiting lecturers to take part in seminars within the universities and engineering schools. The MedEuropeIntern portal will be a helpful tool in this regard.

The student engineers will also have a major role to play in the programme, beyond the involvement of the 40 students selected for the experimental phase. The motivation and enthusiasm of students convinced of the necessity of an action is in general a major guarantee of success: demand from students based on their expectation of results has often been at the origin of the success of actions that were initially considered as too ambitious. The consortium looks to students in particular to promote extracurricular activities which may be an excellent way to acquire the required competencies.

As already specified, the success of the project will depend on a strong commitment by all the partners. The sharing of tasks and responsibilities is planned as follows:

- **All partners:** active participation in at least one of the 4 work groups in Operation 1 which will drive the proposals that are a necessary basis for the success of the rest of the programme.
- **Universities :**
 1. Each university will set up a unit for publicising information among students, for providing advice and support for their personal career plan and for dealing with the various administrative procedures such as those related to placement agreements.



2. Each university will organise for students lectures and seminars in order to meet the requirements of the degree supplement and to facilitate their access to the website.
 3. Academic staff will be made available for the programme to provide on-line documents for the website. The universities will encourage the mobility of academic staff (seminars on relevant themes)
 4. Certain universities will take the responsibility for a specific theme and will organise seminars on these themes. The distribution of these themes will be decided on during the kick-off meeting but it has already been decided that the University of Naples Federico II and the ENIS Sfax will be responsible respectively for the acquisition of competence in innovation-entrepreneurship-technology transfer and sustainable development.
- The **companies and business confederations** will undertake to offer student placements corresponding to the requirements as defined and to organise conferences and seminars focused on giving students an introduction to company management and organisation.
 - The **local authorities** will be responsible for validating needs at the level of the territory and for providing support for the reception and / or outgoing mobility of students.
 - The **RMEI** :
 1. Will be responsible for coordination between the various partners and for the leadership of the project.
 2. Will play the lead role for the dissemination and sustainability of the degree supplement for which it will ensure and guarantee the quality and durability.
 3. Will manage the financial management of the programme.
 4. Will be responsible for actions involving communication, the organisation of events and participation in various forums (including student-industry forums) and conferences.