BA-MA structure follow-up

Domingo Docampo, January 31, 2005.

Before their meeting in Bergen, the Ministers charged the Bologna Follow-up Group with organising a stocktaking process in time for the summit. Detailed reports will be prepared on the progress and implementation of the intermediate priorities set in the three priority areas defined for the period 2003-2005: quality assurance, the **two-cycle degree system** and recognition of degrees and periods of study.

The report should provide a clear and objective overview of the progress made in the signatory States. Meanwhile, we show some data extracted from internet sites related to the work in progress to realizing the goals of the Bologna Declaration as far as the adoption of a system essentially based on two main cycles is concerned. When specific information about engineering degrees is available, a short summary of it is included.

As we shall see when we navigate through the information available at official Bologna web sites, we will realize with C.Tauch (co-author of the Trends III report) that "it becomes obvious that the endeavour they have embarked on promises that are leading them into rather uncharted waters, especially if the following specification of the Bologna Declaration is taken seriously: The degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification".

The introduction of the new structure in countries which did not have intermediate degrees before the long one-cycle degrees that used to constitute the norm in the continent is apparently paving the way for a vision of the bachelor title as a stepping-stone through the appropriate professional qualification associated to the master level. This is made explicit in countries such as Sweden, Norway, Finland, Denmark, and Switzerland, thus leading them to the uncharted waters of the academic qualifications with insecure meaning in the labor market.

Following the same path, the traditionally most important final university degree in France, the maîtrise (comprising some 240 ECTS credits), is to give way to a Master degree at the 300 credits level as a main qualification for the professional world. So, the bachelor degree will be considered in France an academic step, and because all the universities will award the master degree, the Conférence des Grandes Ecoles has decided to create an MSc label as a special "quality label" to distinguish the master degrees awarded by its members from the other master degrees.

Somewhere in between, countries which used to distinguish between introductory engineering qualifications and full qualifications leading through the status of chartered engineer recognised by professional organizations (such is the case of Anglo-Saxon countries all over the world) stick to the short duration programs, three to four years bachelor programs as a rule with one year master programs.

Besides, the distinction between Bachelor and Bachelor with Honours (sometimes due to the learning outcomes of the programs, sometimes to the longer duration, 4 years, of the programs) provides more flexibility and options for the students but also contributes to increase the entropy of the system. To add more spice, the British, mainly in England, wish to keep their Integrated 4 year master engineering (MEng) programs, which only

A-level students can access by the way, and make them equivalent to the 300 ECTS credit master programs in the continent.

In Spain, with our current two-cycle system, it is only apparent that we already comply with the Bologna Declaration guidelines for the new structure, due to two reasons especially notorious in the engineering arena:

1. There is no undergraduate-graduate division in our system.

2. The current first cycle, Ingeniero Técnico, is not recognised, outside Spain, as an introductory engineering level, but rather as a Technician Engineer, which is a qualification normally awarded by vocational institutions outside universities.

To my opinion, two main questions should be clearly answered before taking further decisions:

Shall we adhere to the two (three including the doctorate) cycle Bologna System, with no integrated paths toward upper qualifications?

Shall we take the specification of the Bologna Declaration "the degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification" seriously?

Answering yes to both questions does not preclude giving appropriate professional recognition to graduate studies leading to master degrees with specific professional competences.

Answering yes to both questions will surely alleviate the pain of the much needed reduction of the options at the undergraduate level, and will surely facilitate the discussion about the number of years or ECTS credits that undergraduate and graduate titles should comprise.

In what follows we journey the official Bologna sites in search of clues for the incoming discussion within the Consejo de Coordinación Universitaria.

The information is expected to be more thorough the moment the **stocktaking report** shall be made available at the Bergen meeting in May, which means that a preliminary report should be distributed well before the meeting, on time to our final preliminary decision on the new titles.

Nevertheless, after this electronic journey I do not foresee any spectacular new information in the incoming stocktaking report. Rather, it will confirm the current trend towards a nominal 3+2 structure, with plenty of 4 years exceptions at the bachelor level, and with unclear impact on the labour market of the intermediate qualifications (3 year, stepping-stone bachelor degrees).

So, please, fasten your seat belts, the plane is ready to take off...

Navigation through Official Bologna Sites

Austria: According to the Universities Act of 2002, Universities shall be entitled to offer bachelor and master's degrees, and doctoral programmes. The workload associated with **bachelor**'s degree programmes shall amount to **180 ECTS**, and that associated with master's degree programmes to at least 120 ECTS.

Belgium: The Act of the Flemish Parliament of 2003 states the two-tier system, where a **Bachelor** Degree can be obtained after **3 years** of study and a Master Degree after another 1 or 2 years, with the exception of Medicine. The Act makes a distinction between professionally oriented and academically oriented bachelor's programmes. However, both **Bachelor programmes allow the student** to go on directly to a master's programme or **to join the labour market**. Master's programmes are always academically oriented, not excluding a professional preparation but without literally focusing on a profession. In the French Community of Belgium, the two-cycle structure is being evaluated. The structure is moving towards a **3+1 or 3+2** model depending on the discipline concerned. **The first cycle will essentially be an intermediate cycle.**

Croatia: The three-cycle system was being widely discussed in 2003. Croatia has opted for a flexible approach. A **bachelor** study programme lasts **three to four years** and leads to the degree of "bakalar". A master study programme lasts one to three years, and follows a bachelor study programme.

Cyprus: The undergraduate cycle, with a duration of **four years**, leads to the first final University degree (Ptychio), or **Bachelors** in the Private Institutions; the postgraduate cycle, with a duration of 1-2 years, leads to the Master's Degree.

Czech Republic: A master study programme (1-3) follows a **Bachelor** study programme (**3-4**). The two tier system of studies was implemented without larger problems in social sciences, artistic fields and some natural sciences.

Denmark: Universities may offer these **research-based** full-time programmes:
1) **Bachelor** programme for **180 ECTS**. In exceptional cases, the Minister may deviate from the 180 ECTS, when special circumstances require it.
2) Master's programme (candidatus) for 120 ECTS.
3) PhD programme for 180 ECTS.

Estonia: The nominal length of **Bachelor** studies is **predominantly** three years, **180 ECTS**. In **exceptional** cases, it extends to **240 ECTS**. Bachelor's degree will be a prerequisite for admission to master's programs. The length of master's studies is 60–120 ECTS, but along with bachelor's studies **not less than** 300 ECTS. Medicine, dentistry, pharmaceutical, veterinarian, **architectural and civil engineering** training have one tier studies with a length of 5 to 6 years, 300 to 360 ECTS.

Finland: The Universities Act was amended in 2004. The amendment enacted a two-tier 3+2 degree structure, with a **Bachelors** level of **180 ECTS** degree before Masters level in all fields except medicine and dentistry. **Bachelor degrees do not seem to have any major relevance to the labour market**. It is considered the lower undergraduate degree, an intermediate stage on the way to the upper undergraduate degree, Master, which requires more profound competence and expertise in one's field.

France: In 2002, a reform of the French higher education set in place a new degree structure based on 3 cycles, , LMD: licence (bachelor), master and doctorate. **Bachelor** degrees require **180 ECTS**; Master degrees, either professionally or research oriented, require 120 ECTS after the licence's degree, 300 ECTS altogether. The master degree can also be awarded by the Grandes Ecoles, although as it has been pointed out, with an MSc level to distinguish themselves from other institutions.

Germany: The Conference of Ministers of Education, like the employers in their so-called Cologne Declaration, emphasized that qualification for a profession is an indispensable element of the first, basic Bologna degree. **The Bachelor Degree is then the standard qualification, leading to a first entry into a profession for a majority of students**. The Framework Act for Higher Education (HRG) stipulates **three to four** years as the standard period of undergraduate studies. Only one type of degree is awarded at the Bachelor level, so there is no provision for a Honours Bachelor.

Greece: Ptychio is the Greek name for the **bachelor**-level degree. It normally takes **four year** of full-time **240 ECTS**. The responsibility for establishing master programs rests within the universities themselves. It should be noted that the postgraduate cycle because of its different learning and skills outcomes has claimed already in the mind of the public its own specific characteristics, orientation and value in the labour market.

Iceland: A **bachelor'**s degree **normally** takes **three years**; a master's degree takes one to two years. The two cycle system (3+2) is currentluy used in all disciplines. The degree awarded after **the first cycle is in general terms also relevant to the European labour market** as an appropriate level of qualification.

Ireland generally fits in with the model set out in the Bologna declaration. The Irish see the need to look further at the standards associated with the cycles through the qualifications framework, in relation to learning outcomes associated to the programs. At present Engineering **Bachelor** Degrees take **4 years** and masters one year.

The Institution of Engineers of Ireland has decided to consider the implications for engineering education in Ireland of the Bologna Declaration. The Institution **recommends that the 3+2 structure** be adopted, for the following reasons:
(a) **The 4+1 structure is not favoured in the majority of European countries**. It would result in an imbalance in the distribution of years to both degrees within a five-year framework. Furthermore in a 'post-Bologna' implementation era such a four-year degree might be classified in the same way as a three-year engineering degree.
(b) **The five-year integrated Master** model is highly regarded as a professional engineering qualification but **does not conform to the Bologna Declaration** as it is a single-cycle as opposed to a two-cycle model.

The implementation of the 3+2 structure should result in the creation of two types of three-year Bachelor Degree programmes followed by a two-year Master. Both Bachelor Degree programmes should meet the educational standard required for the title of Associate Engineer, while Master Degree programmes should qualify for the title of Chartered Engineer. Scientific Bachelor Degree would primarily consist of the engineering and scientific foundation needed for the two-year Master Degree. Applied Bachelor Degrees would primarily prepare graduates for employment in industry. Progression from Applied Bachelor Degree to the two-year Master Degree could not be automatic but would require something extra from students to compensate for the difference in entry requirements, programme content and programme outcomes when compared with the Scientific Bachelor Degree.

Italy: Universities confer the following first and second cycle qualifications: a) first degree (Laurea) b) second degree (Laurea Specialistica). To obtain a **first degree** a student must have acquired **180 ECTS**. To obtain a second degree a student must have acquired 300 ECTS including those already acquired by the student and recognised as being valid for the relevant second degree programme. To obtain a university master's degree a student must have acquired al least 60 credits over and above those already acquired by the student for the award of the first degree or the second degree. The last provision means that there are two types of master programs, so called **master di primo nivello and master di secondo nivello**.

Lithuania: Three cycle studies were introduced and fully implemented in the year 2000. A **Bachelor** programme normally comprises **4 years** or **240 ECTS** . However, the Law allows programmes to vary from 210 to 270 ECTS. The Master programme's normal duration varies from 90 to 120 ECTS. Some study fields (not engineering) still retain integrated type of studies insofar as they do not contain the separate first and second cycles and lead directly to either Master degree and/or professional qualification.

Luxembourg: The new Université du Luxembourg will offer academic and professional courses, **bachelor (180-240 ECTS)**, master (60-120 ECTS). At bachelor and master level, it is possible to distinguish between academic and professional streams. The **combined studies at bachelor and master level may not exceed 5 years**.

Netherlands: Universities have moved to bachelor and master programmes.

• **Bachelor** degrees require **180 ECTS** in **academic** education and **240** in **higher professional** education. The primary aim of the professional bachelor is to move on to the labour market. The academic bachelor's primary aim is to follow a master programme, although it also leads to the labour market.

• Master degrees in academic education require 120 credits in engineering, in agricultural disciplines, in life sciences, in natural sciences and in dentistry; 180 credits in medicine; a minimum of 60 credits in other subjects.

• By and large students are admitted to master's programmes on the basis of their having completed a relevant bachelor's programme.

Norway: A new degree structure, consisting of a lower degree, **bachelor**, awarded after **three years** of study and a higher degree, master, after two more years, has been launched. In a few subject areas, students will enrol for a five year integrated degree course (Master), e.g. technology and pharmaceutics. A limited number of study programmes are exempted from the new ba-ma structure.

Portugal: The Government organised the higher education system in 23 thematic areas, having appointed for each cluster an area-coordinator responsible for preparing a report. The reports should include proposals of degree profiles, levels of competence and appropriate duration of each cycle. The study was finished by December 2004 and the reports are available on the web http://www.mces.pt/. A period of national discussion was open till the end of January 2005. A two-cycle system (before doctoral studies) will be adopted, and the **3+2** structure was favoured by the Government at the end of 2004. The topic is very hot in Portugal where a new Parliamentary election shall take place in a few weeks. The Engineering and Architecture reports of the working groups can be downloaded from http://www.mcies.pt/?id_categoria=57&id_item=1953.

Russian Federation: A Decree in 1994 specified the structure of professional higher education, with a Bachelor's degree, 4 years, and a subsequent Master's degree of 2 years. Suggestions for amendments have been submitted for consideration. They include a two-level system of higher education, with a **bachelor (3 to 4 years)** and master (2 years) or specialist's diploma on the basis of bachelor's degree (1 to 2 years).

Slovenia: The first cycle offers academically oriented and professional programmes. F**irst cycle** programmes range from **180 to 240 ECTS**. A general requirement for admission to second cycle programmes is a successfully completed first cycle programme. Second cycle programmes contain 60 to 120 ECTS. Programmes in the same field must not exceed five years altogether (3+2, 4+1).

Spain: New decrees have been approved on January 21, 2005 implementing the three cycle structure of the Bologna process. Bachelor degrees are stipulated to last between 180 and 240 ECTS, while master degrees range from 60 to 120 ECTS. Particular options within the disciplines shall be taken along the next two years in a process launched by the Government through the Consejo de Coordinación Universitaria.

Sweeden: The general degrees before doctoral level are: "kandidatexamen", at least three years of full-time study, "magisterexamen", at least four years of full-time study, and "licentiatexamen", normally two after three years of full-time study. There are more than fifty **professional programmes** organised according to a different structure. Both a Master of Science in Engineering and a Master in Architecture require **270 ECTS**.

In 2002, a project group, *Degree review,* was appointed to clarify the structure. The Review group proposed the adoption of the three Bologna cycles. It also proposed that in order to gain admittance to programmes at the graduate level leading to a master's degree, the student must have the requirements needed for a **bachelor**'s degree (**180 ECTS**) or a **professional degree** comprising **at least 180 ECTS**. It also proposed two possible master degrees, one after completing one year of graduate studies, and another after two years. Programmes leading to a professional degree comprising 240 ECTS or more would, if the proposal is accepted, include both first cycle and second cycle studies. Such programmes will not be formally divided into two separate cycles.

Switzerland: The legal framework was put in place for the universities of applied sciences in 2002 and for the universities in 2003. The former will start their **bachelor** programmes (**three years)** in 2005 or 2006 in a coordinated manner. Master programmes (two years) are intended to begin three years later. The report of the Conference of Swiss Rectors, CRUS, in contrast to the Bologna Declaration, says that a **Bachelor's degree in Engineering Sciences is neither seen as a professional qualification,** nor is it a compulsory prerequisite for graduate admission within the same institution. Rather, it is the opinion of CRUS that a **true professional qualification for a university level engineer is only attained at the Master's level**; as a consequence, the normal university level engineering curriculum is a 4-5 year integral course leading directly to a Master's degree. Thus, the **Bachelor's level is primarily interpreted as an intermediate mobility pivot**.

Turkey: At undergraduate level, two year Associate's and **four year Bachelor**'s degrees are awarded. Graduate level programmes consist of Master and Doctorate degrees. Master degrees are awarded after successful completion of two-year university study. There Master programmes that require a thesis, and programmes which do not. Duration of the non-thesis Master's programmes is one and half years.

UK: The UK degree system is based on 3 main cycles (Bachelors/Masters/Doctoral). Traditional **Honours Bachelor degrees** take **3 or 4 years to complete** and most postgraduate Masters courses take between 1 and 2 years, depending on the particular learning outcomes. There are some exceptions in the case of professional qualifications. Scottish **Bachelor** Degrees take **three years** and **Honours degrees** take **four years**. Most postgraduate **Masters courses can be completed in one year.** A large majority of students graduate with a Bachelor's degree and go directly into employment.
There are some concerns about how integrated four and five-year first courses iwhich lead directly to a Masters level award fit into the structures proposed by Bologna.

COUNTRY	BACHELOR	MASTER	EXCEPTIONS
Austria	3	2	Medicine
Belgium (Flem)	3	1-2	Professional BA(4)
Belgium (French)	3	1-2	
Croatia	3-4	1-3	
Cyprus	4	1-2	
Czech Republic	3-4	1-3	
Denmark	3	2	At Bachelor Levels there may be
Estonia	3	1-2	Some BA(4), some integrated Ma(5-6)
Finland	3	2	Medicine and Dentistry
France	3	2	Grandes Ecoles still out
Germany	3-4	1-2	No Honours Bachelor provision
Greece	4	1-2	
Iceland	3	2	Medicine, Dentistry, Pharmacy
Ireland[1]	4	1	
Italy[2]	3	2	See the note for master level
Lithuania	4	1,5-2	Law allows 210-270 ECTS BA's
Luxembourg	3-4	1-2	
Netherlands	3	1-2	Professional BA(4)
Norway	3	2	Integrated MA(5) Tech and Med
Portugal[3]	3?	2?	
Russian Federation[3]	3-4?	2?	
Slovenia	3-4	1-2	
Spain	3-4	1-2	
Sweden	3	2	Professional MA(4,5) Eng. and Arch.
Switzerland	3	2	CRUS proposal Integrated MA(4-5)
Turkey	4	2	
UK	3	1	Honours BA(4), Integrated MA(4)

Table 1: Duration of BA-MA studies

[1] The Engineering Profession recommends the 3+2 structure.
[2] The Italian System distinguishes between second cycle and master degree. As a matter of fact, there are two kinds of master degrees after the first and second cycle.
[3] No decision taken yet.

Appendix

1. Conclusions and Recommendations of the Seminar on Bachelor-level Degrees: Helsinki, Finland, 2003.

Bachelor-level degree is a higher education qualification the extent of which is 180 to 240 credits (ECTS). It normally takes three to four years of full-time study to complete the degree. Bachelor-level degrees play an important role in the life-long learning paradigm and learning to learn skills should be an essential part of any bachelor-level degree. It is important to note that the bachelor-level degrees, often referred to as first degrees can be taken at either traditional universities or at professionally-oriented higher education institutions.

Programmes leading to the degree may, and indeed should have different orientations and various profiles in order to accommodate a diversity of individual, academic and labour market needs. Even bachelor degrees which serve as an intermediate qualification preparing students for further study should be based on a proper curriculum. They should not only be seen as a part of a longer curriculum, as some students may wish to change direction or to choose a graduate programme or specialisation offered at another institution.

In the European tradition higher education has never been an island. There is a strong need for close interaction between higher education and society at large. Labour market relevance should not undermine higher education's cultural value. There are many different ways in which bachelor-type degrees can be relevant to the common European labour market. While many curricula ought to be geared towards specific professions and immediate entrance onto the labour market, others need to prepare students for further studies and a later entrance. In European countries labour markets expect higher education qualifications from more and more young people. This is likely to be more difficult in countries offering only long one-tier qualifications. The higher education system is expected to offer independent, shorter degrees of the bachelor type geared specifically for labour market needs.

Different disciplines have characters of their own and they have to be taken into consideration when developing degree structures. It should be clear that in some fields which involve professional accreditation, bachelor-level degrees will not always serve as independent qualifications leading to full labour market relevant professional competence. However, in those fields too an intermediate qualification may be worth developing for the reasons mentioned above.

2. Conference on Master-level Degrees, Helsinki, Finland: March 2003

There seems to be a trend towards master degrees the total extent of which is 300 ECTS credits. In practice, this usually means five years of full-time studies. The degree structures still vary considerably between the countries taking part in the Bologna Process. In addition, the two-tier structure is still perceived differently in our respective countries. In some higher education systems, bachelor's and master's degrees are seen as clearly self-supporting entities, whereas in others, the two cycles form rather a cumulative sequence of knowledge, skills and competencies in more or less the same disciplinary area.

3. Framework of reference for master degrees in Europe, 2003.

There are various European initiatives underway today that aim at defining learning outcomes and skills and competencies both at the bachelor and master level. This will allow capitalising on the richness of European higher education traditions and creating European profiles in the various disciplines. Some common criteria for the structural definition of master's degrees are needed. This framework of reference should be flexible enough to allow national and institutional variations, but at the same time clear enough to serve as a definition.

The following recommendations adopted by the participants in the conference could be seen as useful common denominators for a master degree in the EHEA:

1. A master degree is a second-cycle higher education qualification. The entry to a master's programme usually requires a completed bachelor degree at a recognised higher education institution. Bachelor and master degrees should have different defined outcomes and should be awarded at different levels.

2. Students awarded a master degree must have achieved the level of knowledge and understanding, or high level in artistic competence when appropriate, which allows them to integrate knowledge, and handle complexity, formulate judgements and communicate their conclusions to an expert and to a non-expert audience. Students with a master degree will have the learning skills needed to pursue further studies or research in a largely self-directed, autonomous manner.

3. All bachelor degrees should open access to master studies and all master degrees should give access to doctoral studies. A transition from master level to doctoral studies without the formal award of a master’s degree should be considered possible if the student demonstrates that he/she has the necessary abilities. Differences in orientation or profile of programmes should not affect the civil effect of the master degrees.

7. While master degree programmes normally carry 90-120 ECTS, the minimum requirements should amount to 60 ECTS at master level.

8. In certain fields, there may continue to exist integrated one-tier programmes leading to master degrees. Yet, opportunities for access to intermediate qualifications and transfer to other programmes should be encouraged.

4. Conclusions and recommendations Of the Seminar on Bachelor’s Degree 2004, St. Petersburg, Russia

1. Taking into account the significant role played by humanities and social sciences in curricula in terms of ensuring generic competences, and at the same time widely divergent views and practices concerning the number of credits allocated to the humanities in different study programmes, the seminar recommends to set up a special working group for the study of the role to be played by humanities in higher education.

2. Proceeding from the general agreement that bachelor-level programmes are meant to ensure sufficiently broad competences, programme designers are recommended to pay special attention to interdisciplinary and field-specific modules. Based on existing descriptors the structure of competences would then be as follows: generic competences, interdisciplinary competences, field-specific competences and subject specific competences.

3. In designing bachelor-level study programmes for higher education, the designers should pay more attention to labour-market requirements and challenges.

4. It is recommended to amend the position taken by the Bologna Declaration to make it clear that access to doctoral studies shall require a completed master's degree.

5. EUA and the steps taken in the Bologna Process implementation, spring 2004.

The nature of the reform process – with each country moving in its own way towards a common, but somewhat elusive, goal – has understandably sometimes generated confusion and thrown up contradictions. In terms of core reforms, such as the introduction of a two cycle degree system, debate and discussion on the direction of reform, of course, reflects the diversity of national systems, culture and traditions. Hence reforms which are intended to improve transparency by using common terminology may sometimes inadvertently muddy the picture. For example, while some countries have decided to introduce a first-cycle bachelor qualification to be awarded after 180 ECTS credits (three years), others have opted for new first-level bachelor qualification awarded after 240 ECTS credits (four years). And if first-level qualifications are differently understood, what does this imply for second-level qualifications? In addition this impacts on mobility issues. Is it possible to encourage more vertical mobility (i.e. from one institution to another between first and second level studies – studying a masters in a different country from where the bachelors was completed) if the length of first and second study cycles are different? How much room for diversity of curriculum contents is feasible within first or second level degree programmes if institutions are trying to encourage mobility within the course of a study programme?

6. FEANI and the Bologna Declaration

The European Federation of National Engineering Associations (FEANI from the French Translation) has developed a system of recognition of engineering expertise through the analysis of the higher education, training and professional experience of the candidate. In order to be recognised by FEANI as a EUR ING, an engineer must have a minimum of 3 years engineering higher education (included in the FEANI Index) and a minimum 2 years of relevant engineering experience. Overall, the candidate must have at least 7 years of engineering education and practice.

With a large experience in the field of the engineering profession, FEANI welcomes the signing of the Bologna Declaration by the Ministers in charge of Higher Education. FEANI agrees with the adoption of a two cycles engineering higher education system and has adapted its Index of engineering courses to include this definition. Engineers with a 1st cycle degree and engineers with a 2nd cycle degree are both relevant to the economic development of Europe. Integrated five years programs are also recognised as

a relevant academic basis for the engineering practice. A 1st cycle degree awarded after three years of such a program will enable the degree holder to transfer to another integrated engineering program or gain employment based on the acquired skills, but may not meet FEANI higher education requirements.

7. CESAER and SEFI on the Bologna Declaration, February 2003.

The Conference of European Schools for Advanced Engineering, CESAER, and the European Society for Engineering Education, SEFI, firmly believe that the supply of highly qualified engineers is of vital importance to the future economic and societal development of Europe. Thus, there is a need to ensure that the competences required of engineering graduates are recognized and are not compromised by provisions directed to the whole of Higher Education. The introduction of a larger number of second cycle (Master's) degree programmes, building on first cycle (Bachelor's) degrees, will no doubt make European Engineering Education more attractive for non-European students. In the context of the new first and second cycle degree structure, the engineering community of Europe agrees that in order to attain a high level of scientifically oriented competencies, engineering graduates need to be educated to a level corresponding to second cycle Masters level degrees. It is thus important that any new procedures and regulations do not compromise the number and quality of such graduates. In particular, there must continue to be provision for an integrated route through to the Masters level as this preserves the coherence and efficiency of the formation. This implies that where structures include the award of a first cycle (Bachelors) degree, that stage should be regarded mainly as a pivot-point rather than a normal finishing point. The pivot-point allows choice of specialization and mobility between first and second cycles but it is important that financial and regulatory barriers do not impede the continuation into the second cycle stage.

Summary of recommendations of CESAER and SEFI

1 The special role and features of engineering must be taken into account in the Bologna Process.

2 In the scientifically oriented programmes the students should normally be educated to the level of the second degree. There must continue to be provision for an integrated route through to second cycle Masters level.

3 The specific qualities of the presently existing, application-oriented first cycle degrees must be recognized and safe-guarded with bridges to second cycle programmes being provided.

4 The European Research Area and its links to the Higher Education Area have to be strengthened. Competition for support has to be based on merits and on quality. Joint Programmes for doctoral studies should be supported, but the doctoral level as such should not be brought into the Bologna process.

5 Criteria for degrees in engineering should be based on learning outcome and on competence rather than solely on student workload.

6 Higher education institutions need to strive for quality and for excellence. Their governance structures and decision-making processes must support these goals.

7 Higher education institutions themselves have the primary responsibility for the quality assurance of their own programmes. Networking of Universities and liaison between national quality agencies could create added value, centralized European control has to be avoided.

8 Transnational recognition of engineering degrees at professional level has to be a primary goal.