



Winds of change on the Portuguese System on Engineering Education

Sebastião Feyo de Azevedo
sfeyo@fe.up.pt
<http://www.fe.up.pt/~sfeyo>

EURO-CASE Workshop on
Engineering Education in Portugal
LNEC, Lisbon, Portugal, 21 September 2006



Contents

- ☞ **Scope**
- ☞ **Framework for development**
 - ✓ *Bergen Agreements*
 - ✓ *Directive for Professional Qualifications*
- ☞ **In Portugal - Information**
 - ✓ *2006, Year of changes - legislation approved at national level*
 - ✓ *Professional legislation, the role of OE*
 - ✓ *Some figures concerning engineering education in Portugal*
 - *Market Demand-Offer*
- ☞ **In Portugal - Some key issues**
 - *Profiles of offer Institutions/courses*
 - *Design of engineering degrees*
 - *Accreditation*



SCOPE

☞ **Bologna is about**

- ✓ *Promoting changes of the pedagogical methods....*
- ✓ *Adapting the Higher Education structure of offer...*
- ✓ *Promoting quality assurance...*
- ✓ *.....*

☞ **For**

- ✓ *Increasing European cohesion through mobility*
- ✓ *Widening and increasing the level of education...*
- ✓ *Inducing development through transnational co-operation*
- ✓ *Being competitive with other blocks...*

☞ **I discuss Today mainly**

- ✓ *The structure of offer*
- ✓ *Quality assurance*



Two major documents in this framework of development I - The Bergen Declaration within the Bologna Process (I)

☞ **The Bergen Communiqué signed by Ministers of Education of 45 Countries reaffirms the Bologna Process and gives a step forward**

- ✓ **Adopts the overarching framework for qualifications in the EHEA, comprising three cycles**
- ✓ **Adopts the standards and guidelines for quality assurance in the European Higher Education Area as proposed by ENQA.**
 - **Will introduce a model for peer review of quality assurance agencies on a national basis,**
 - **Welcomes the principle of a European register of quality assurance agencies based on national review.**



Two major documents in this framework of development I - The Bergen Declaration within the Bologna Process (II)

- ☞ Innovates the offer of education, promoting a more basic level of professional relevance

'..... We adopt the overarching framework for qualifications in the EHEA, comprising three cycles

(including, within national contexts, the possibility of intermediate qualifications),

generic descriptors for each cycle based on learning outcomes and competences...'



Two major documents in this framework of development II - The Directive for the Recognition of Professional Qualifications (I)

- ☞ Reaffirms previous Directive, accepting 7 professional areas with recognized specifications

- | | |
|-----------------------------------|-------------------------------|
| ✓ Medical training | Minimum education - 6 anos IT |
| ✓ Training of veterinary surgeons | Minimum education - 5 anos IT |
| ✓ Basic dental training | Minimum education - 5 anos IT |
| ✓ Training as pharmacists | Minimum education - 5 anos IT |
| ✓ Training of nurses | Minimum education - 3 anos IT |
| ✓ Training of midwives | Minimum education - 3 anos IT |
| ✓ Training of architects | Minimum education - 4 anos IT |

- ☞ Engineering is out of this group



Two major documents in this framework of development II - The Directive for the Recognition of Professional Qualifications (II)

- ☞ Article 11 - Five levels of qualification particularly relevant for professions that are out of the Annex
 - ✓ 2 levels requiring secondary education, general or vocational
 - ✓ 1 level, requiring short post-secondary education, not necessarily at higher education level, plus professional training
 - ✓ 2 levels of post-secondary education at higher education level, plus adequate professional training



Two major documents in this framework of development II - The Directive for the Recognition of Professional Qualifications (III)

- ☞ Art. 11, e)
...completed a post-secondary course of at least four years' duration...at a university or establishment of higher education...and where appropriate completed professional training...
- ☞ Art. 11, d)
...training at post-secondary level of at least three and not more than four years' duration...at a university or establishment of higher education...as well as the professional training that may be required...
- ☞ Art. 11, c)
...training at post-secondary level other than that referred in d) and e) of a duration of at least one year...as well as the professional training which may be required in addition to that post-secondary course...



A striking coincidence or concerted action?

- ☞ **The Bergen Declaration and the Directive point out in the same direction**
 - ✓ Recognition of different qualification levels and profiles
 - ✓ Recognition that qualifications can be attained through routes in two different subsystems
- ☞ They fit remarkably well in the world of engineering and the offer of engineering education in Europe
- ☞ They should obviously be translated into our accreditation systems



2006 - the Year of the beginning of legal changes in Portugal

- ☞ **Law nº 74/2006 of March 24, academic degrees and higher education diplomas**
 - ✓ *Universities and Polytechnics*
 - ✓ *Promotes a binary system of profiles*
 - ✓ *First cycle degrees - 180-240 ECTS - title Licenciado (Licenciante? License? Bachelor) in both*
 - ✓ *Second cycle degrees - 90-120 ECTS - Master in both with restrictions*
 - ✓ *Possibility of Integrated Masters - 300-360 ECTS in Univs*
 - ✓ *3rd Cycle - Ph.D. - not for the present discussion*
 - ✓ *Introduces an accreditation system (not immediate)*
 - ✓ *Compulsory changes till 2007/2008*
- ☞ ***The Race started immediately among Schools....***



Engineering Education and the Engineering Profession I - Academic Titles till 2006-2007

- ☞ Academic titles at present (2006) still awarded by Portuguese Institutions of Higher Education :
 - ✓ *Bacharel* a 3 years course
 - ✓ *Licenciado* a 5 years course
 - ✓ *Mestre* 2 further years of study, after *Licenciado*, including a course and research
 - ✓ *Doutor* 3 to 4 further years of research, after *Licenciado* or *Mestre*
- ☞ Academic Titles after the reform, 2006/2007:
 - ✓ *Licenciado* 6 to 8 semesters of work (full-time equivalent)
 - ✓ *Mestre* after further 3 to 4 semesters or through an integrated programme
 - ✓ *Doutor* after a minimum of 3 years of course and research work

Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt



Engineering Education and the Engineering Profession II - Figures before 2006-2007

- ☞ 297 Engineering Courses under 126 Designations
- ☞ 64 Schools of Engineering in 44 Institutions of Higher Education
 - ✓ 30 institutions of the public subsystem
 - 13 Universities with their 18 University Schools
 - 17 Polytechnic Institutes with their 29 Polytechnic Schools
 - ✓ 14 Institutions of the Private and Concordatary subsystem
 - 7 Universities with their 7 University Schools
 - 7 Higher Education Institutions with 10 Polytechnic Schools
- ☞ Out of the 297 courses
 - ✓ 97 courses are currently accredited by the Order of Engineers, corresponding to 56 different designations

Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt



Engineering Education and the Engineering Profession III - Professional Titles and Professional Regulation

- ☞ Professional Titles are legally protected in Portugal:
 - ✓ The professional title of *Engenheiro* (Engineer) is awarded by the Order of Engineers. All *licenciados* may apply for the professional title of Engineer.
 - ✓ The professional title of “Engenheiro Técnico” (Technical Engineer) is awarded to any *bacharel* by ANET (Associação Nacional dos Engenheiros Técnicos - National Association of Technical Engineers)
- ☞ The Engineering Profession is partially regulated in Portugal
 - ✓ Some acts, namely in Civil Engineering, but also in areas of Electrical and Mechanical Engineering, can only be performed by members of Order of Engineers

Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt



The Accreditation Process as run by Order of Engineers Today I - Formal Objectives, Practical Consequences

- ☞ Formal
 - ✓ The accreditation process aims at exempting candidates from the admission exam
 - ✓ A Candidate holding a diploma from an accredited course IS EXEMPTED from the admission exam
- ☞ Practical consequences
 - ✓ Far wider consequences
 - ✓ Accreditation is an exercise that leads to significant organisational improvements
 - ✓ Accreditation is perceived by the Society as a stamp of quality of a course offered by an institution

Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt

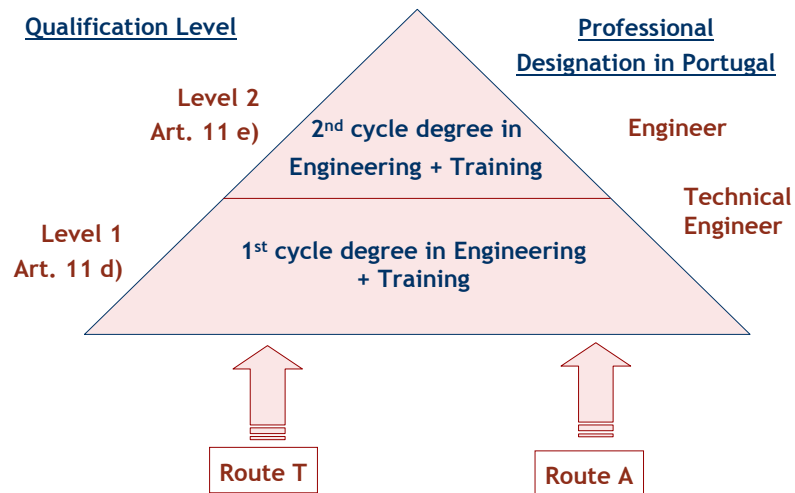


What is going on...

- ☞ The offer is far higher than the demand...
 - ✓ In the public system, candidates to enter a HEI in September 2006:
 - 46528 places
 - 34841 candidates
- ☞ Universities want integrated studies...
 - ✓ Currently 35 Integrated Masters approved
- ☞ Polytechnics want to award Ph.Ds...
 - ✓ Currently no Master as yet approved, but not all institutions submitted processes for analysis

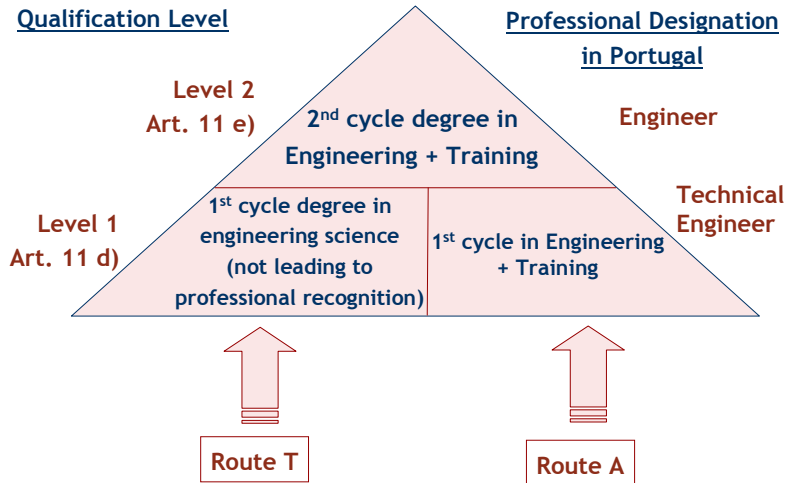


Recognition of Professional Qualifications Routes for the different qualification levels (I)





Recognition of Professional Qualifications Routes for the different qualification levels (II)

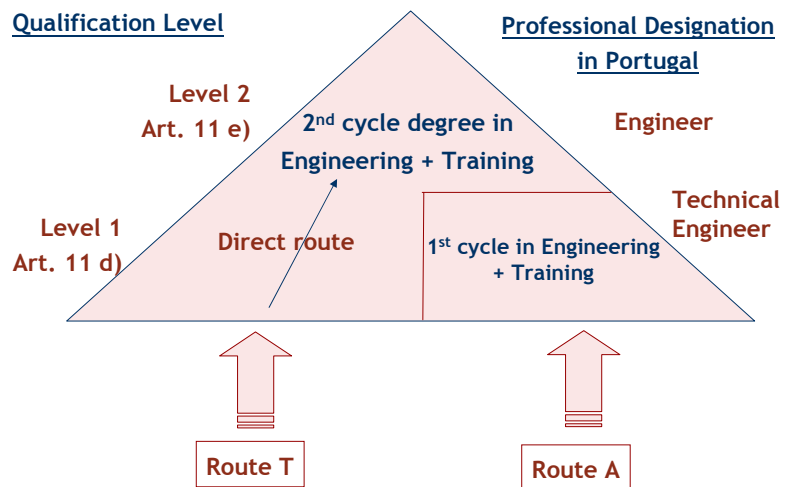


Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt



Recognition of Professional Qualifications Routes for the different qualification levels (in the spirit of the Bologna Process?)



Workshop EURO-CASE, Lisbon, September 21, 2006

sfeyo@fe.up.pt.pt



The position of Order of Engineers concerning the new degrees

- ☞ Recognizes that there are two profiles and two levels of competences
- ☞ Considers that the second level of studies and of professional competences in Portugal requires 300 ECTS of accumulated studies
- ☞ Considers that it is up to the institutions to organise their offer of education
- ☞ Favours an accreditation system with European meaning



Issues concerning the new offer of studies

- ☞ Should we draw a massification line? Or leave the market work?
 - ✓ In the intermediate studies, below first cycle?
 - ✓ On the first cycle studies, below second cycle?
- ☞ Two profiles - more theoretical oriented and more applications oriented?
 - ✓ In which Higher Education Institutions?
- ☞ Integrated studies - what is the European panorama?
 - ✓ Which criteria for integrated studies?
- ☞ Key issues for mobility and co-operation?
 - ✓ How to promote TRUST?
- ☞ New methods - increasing success



Finally,
I would like to know what's going on in YOUR Countries....

- ☞ **Binary system of education?**
 - ✓ **More theoretically oriented?**
 - ✓ **More applications oriented?**
- ☞ **Degree structure?**
- ☞ **Integrated studies?**
- ☞ **Promotion and enforcing of new methods for teaching/learning?**
- ☞ **Accreditation systems?**