

EUROPEAN EDUCATION IN GEODETIC
ENGINEERING CARTOGRAPHY AND
SURVEYING



State of the Art of Issues related to
Engineering Education in Europe

Results of the 3-years operation of the
EEGECS network: Working Group 1
(Undergraduate education)

Athens, Greece 30 November – 1 December 2006

Rosa M. Chueca
Chairperson of WG1, EEGECS

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and Cartography Engineers
Politechnic University of Madrid

FIRST YEAR TASKS

From December 2002 to September 2003:

- **Finish the structure of the questionnaire**
- **Consult to determinate the structure of the national reports**
- **Study of the Tuning Project (responsible: Deusto University, Spain), to learn about methodologies for comparison of diplomas**
- **Deliver the questionnaire, gather answers**
- **Finish the structure of the national reports**
- **Analysis of answers.**
- **Elaboration of national reports.**
- **Inclusion of the national reports in the EEGECS website.**

SECOND YEAR TASKS (1)

From September 2003 to end October 2003:

- **Contact the persons involved in the Tuning Project (for instance the Deusto University in Spain), to learn about methodologies for comparison and tuning of diplomas in the area closest to our discipline.**
- **Elaborate a report on the information gathered, to deliver it to all members of WG1 (and eventually to the rest of WG), for their study.**

SECOND YEAR TASKS (2)

From November 2003 to end April 2004:

- Elaborate a questionnaire about study systems, to be delivered to other parts of the world (USA, Latin-America, Canada etc...).
- Deliver questionnaire.
- Gather and analyze answers, and elaborate a report on structures of study systems at other parts of the world.
- Workshop (meeting at some time or via email, videoconference...) and further work and communication:
 - Analysis of national reports on study systems, degrees etc...
 - Identification of common elements and differences.
 - Elaborate a methodology for comparing degrees in the discipline,
 - Identify obstacles and strengths to move to a two-tier degree system
 - Elaborate a list of groups to contact for information on curriculum development and do a survey on these groups.

SECOND YEAR TASKS (3)

From May 2004 to end July 2004:

- **Contact the groups identified above, via questionnaire, via personal visits/email, via visiting their websites... and elaborate a report on their criteria about curriculum development.**

THIRD YEAR TASKS (1)

October 2004:

- **Reflection-meditation by each member of WG1 to analyze the reports done by other WG. Think of ways to include research into education; the needs of the market (skills and lifelong learning and research; languages, mobility and the new subject; best pedagogical practices...).**

November 2004:

- **WG1 members 2-4 days meeting: Forum to start defining the core curricula. Presentation of all reports and discussion, exchange of ideas... definition of a core curriculum (general) and core curricula for different specialisations.**

THIRD YEAR TASKS (2)

December 2004 to March 2005:

- **Further advances in core curricula:**

Work individually and in co-operation with the rest of WG1 via email, videoconference etc..., to design the core curricula identified in the meeting.

April to end June 2005:

- **2 - 4 days meeting:**
 - **Finalise core curricula.**
 - **Write a set of recommendations for implementing the core curricula proposed.**

European survey (The questionnaire)

The first and most important task accomplished in the 1st year was the making of a questionnaire for Higher Education institutions in Europe.

The questions included in this survey were determined to obtain actual information related to the objectives of our area of action:

- Adoption of ECTS
- Implementation of Diploma Supplement
- Adoption of a 2-tier degree system
- State-of-the-art of our disciplines in Europe

The final version of the questionnaire was sent by email for all the EEGECS members and other European institutions in February and March 2003

European survey (The answers)



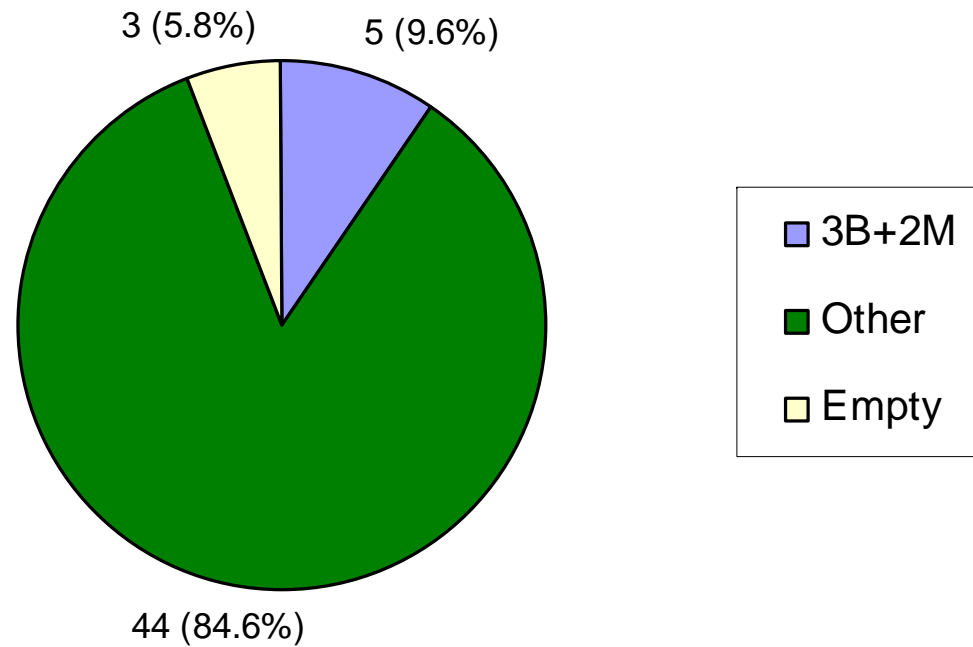
A total of 52 answers arrived from a total of 44 higher education institutions in 17 European countries

European survey (The information)

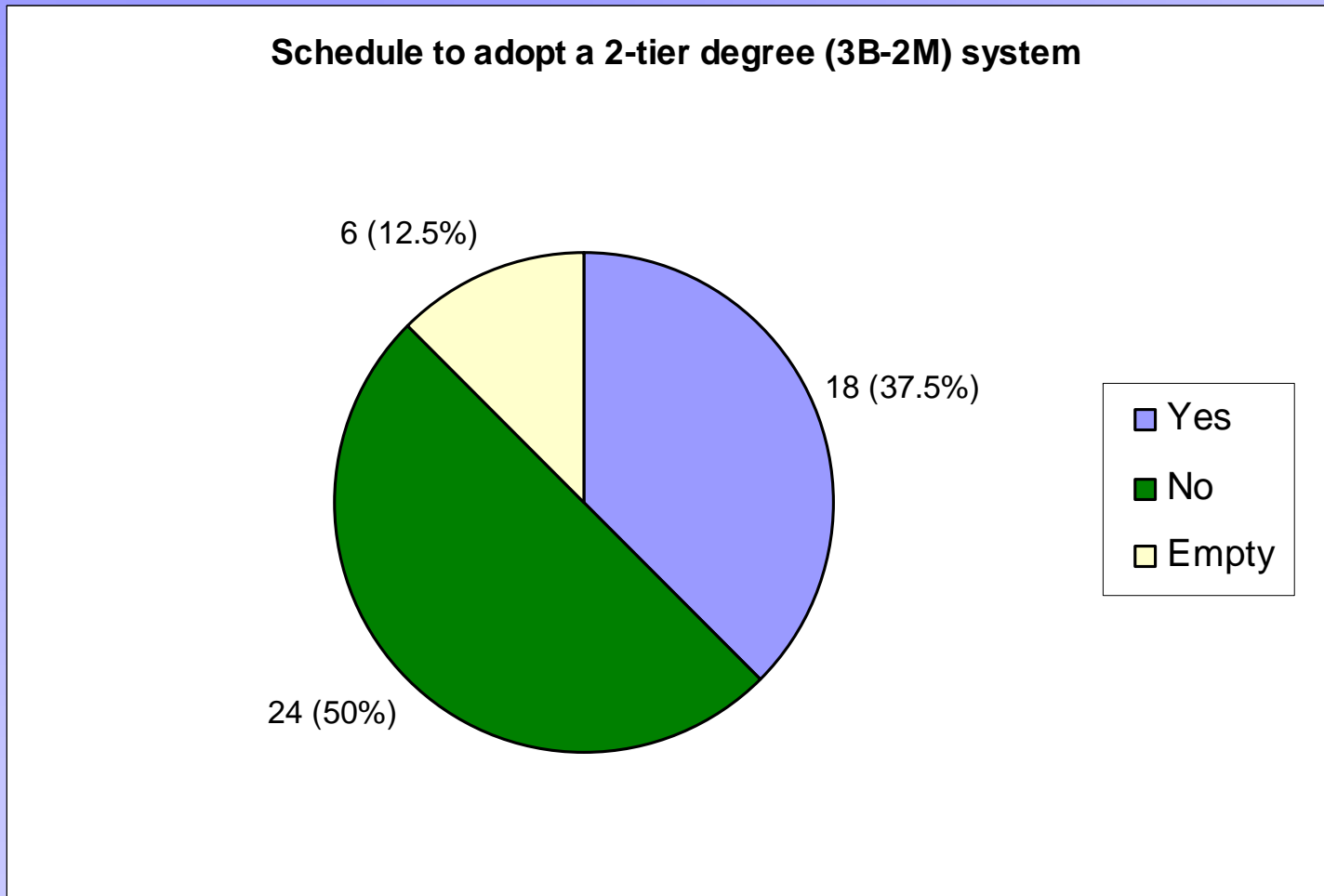
A file (Europe Information) with the answers to the questionnaire from institutions, members or not of the thematic network, and the report on common elements and differences (WG1 Europe) were made by our first chairman Jesus Reyes and included in the first year report (WG1: Our first year of activities).

Identify common elements and differences (1)

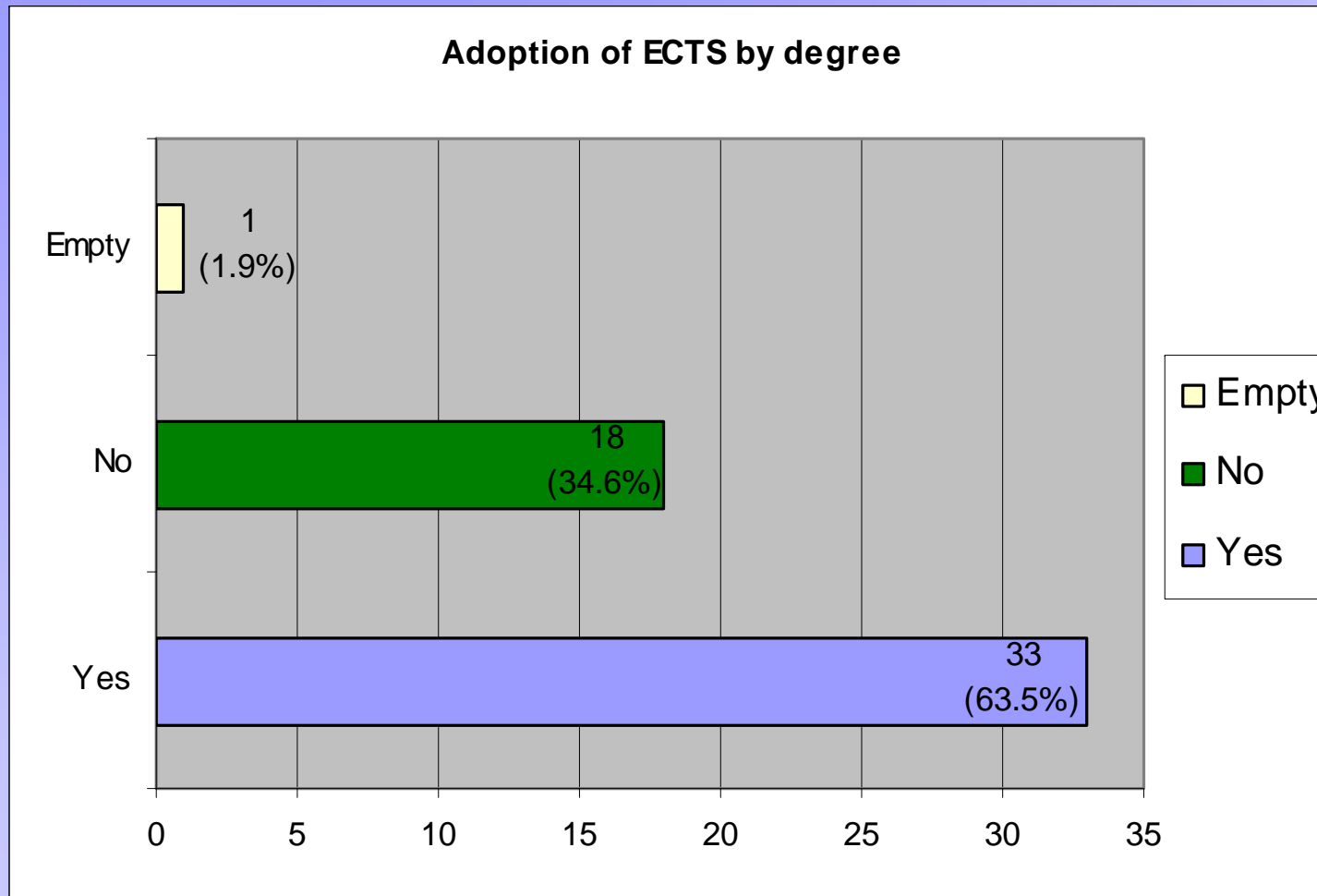
Degree systems in the participating intitutions



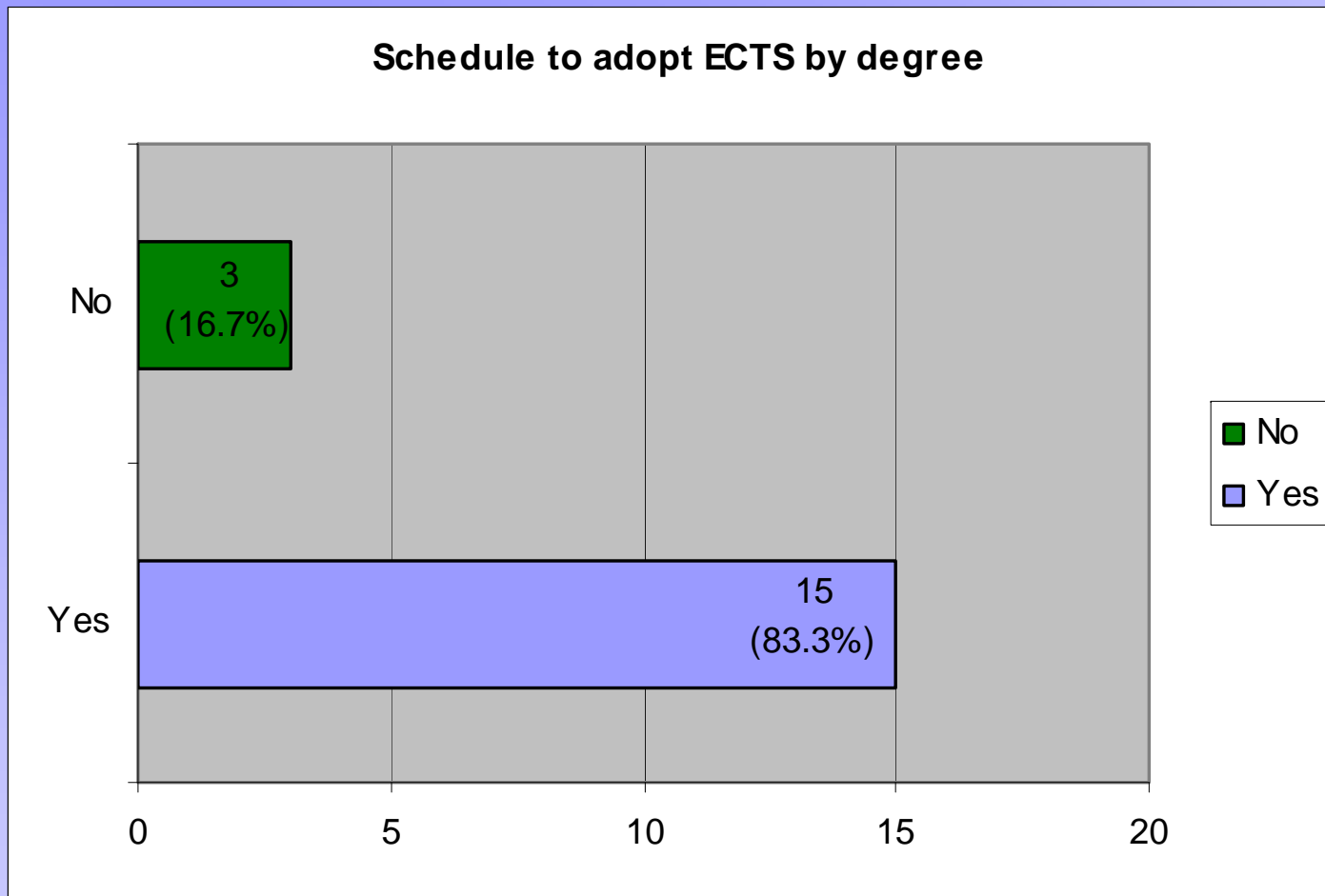
Identify common elements and differences (2)



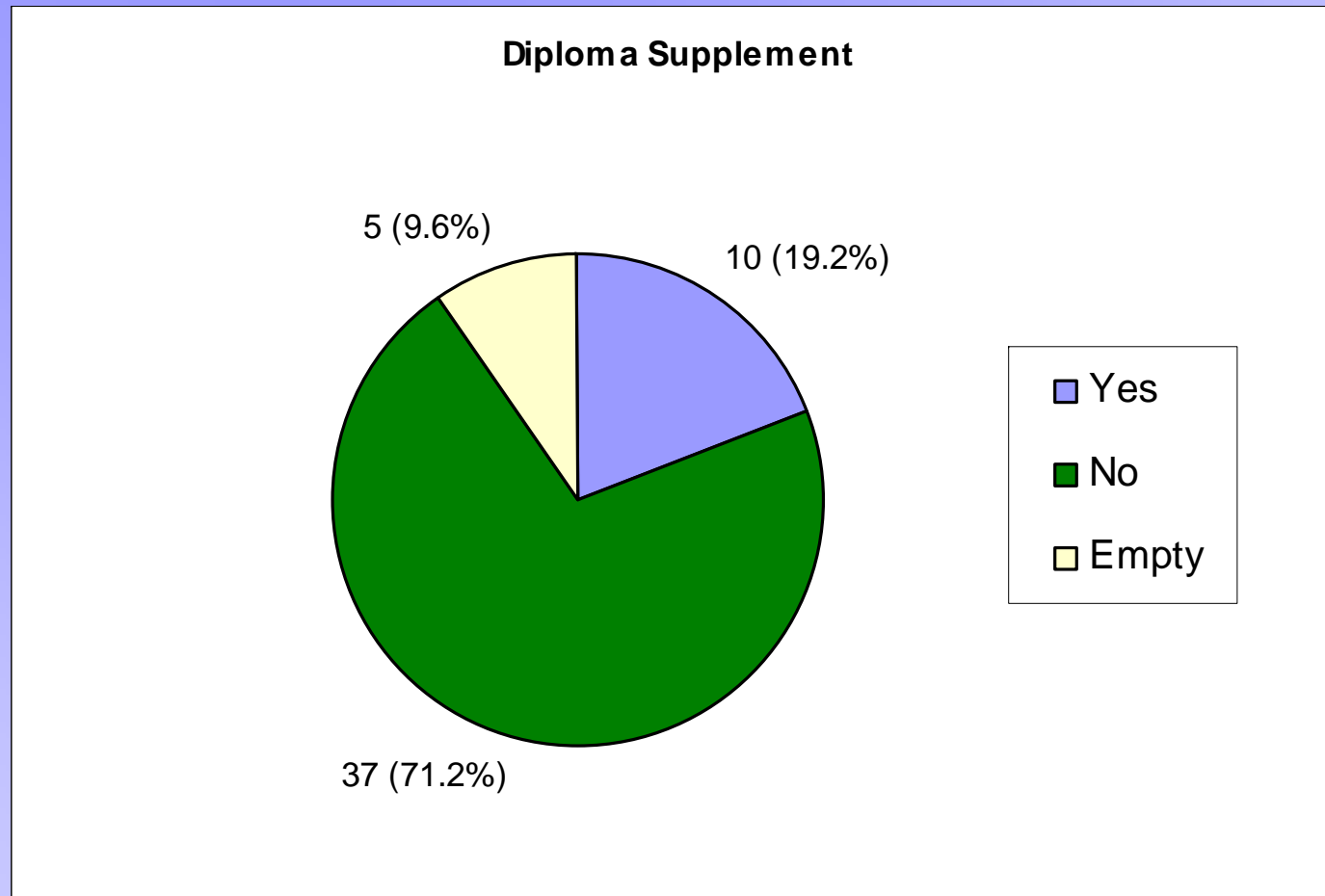
Identify common elements and differences (3)



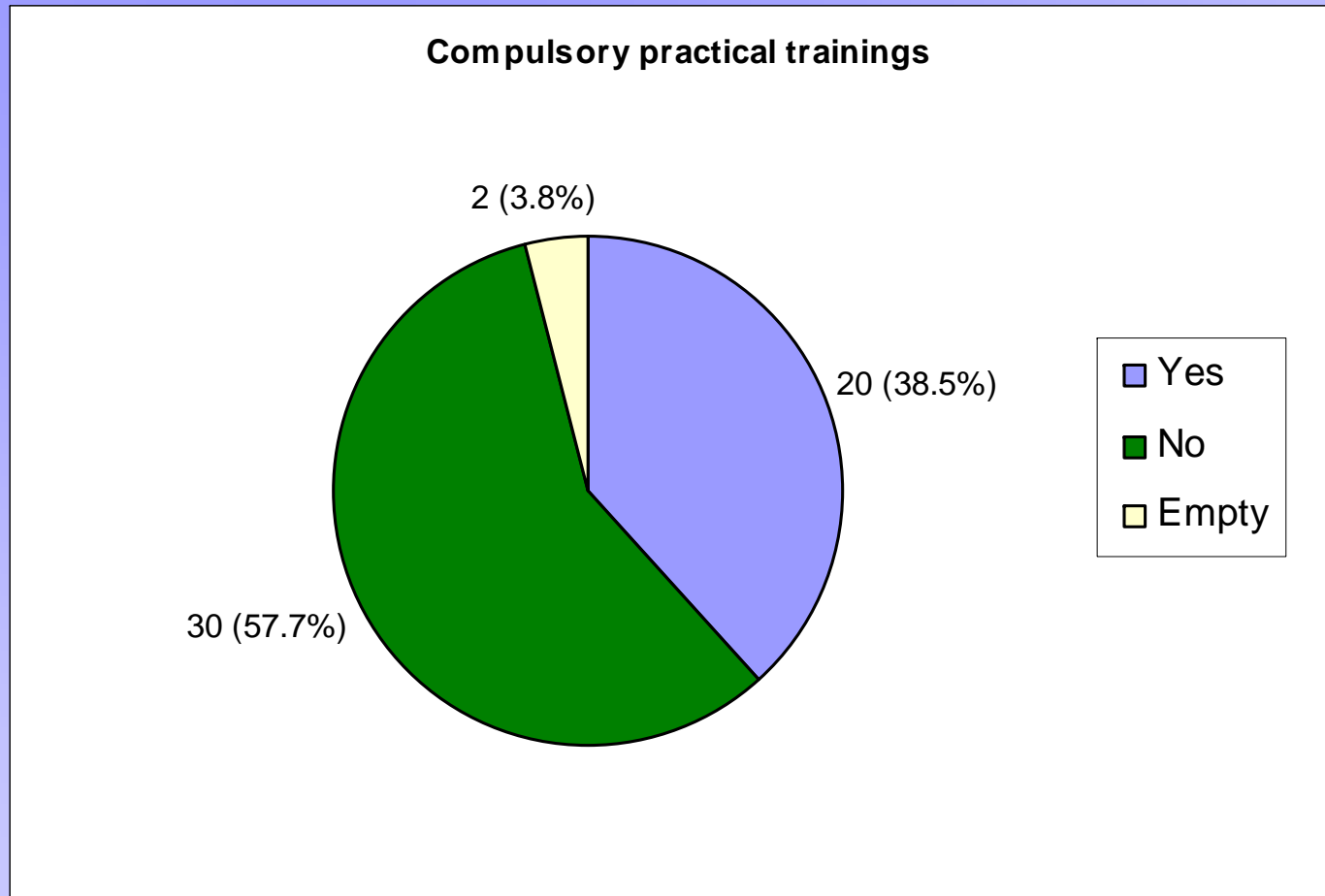
Identify common elements and differences (4)



Identify common elements and differences (5)

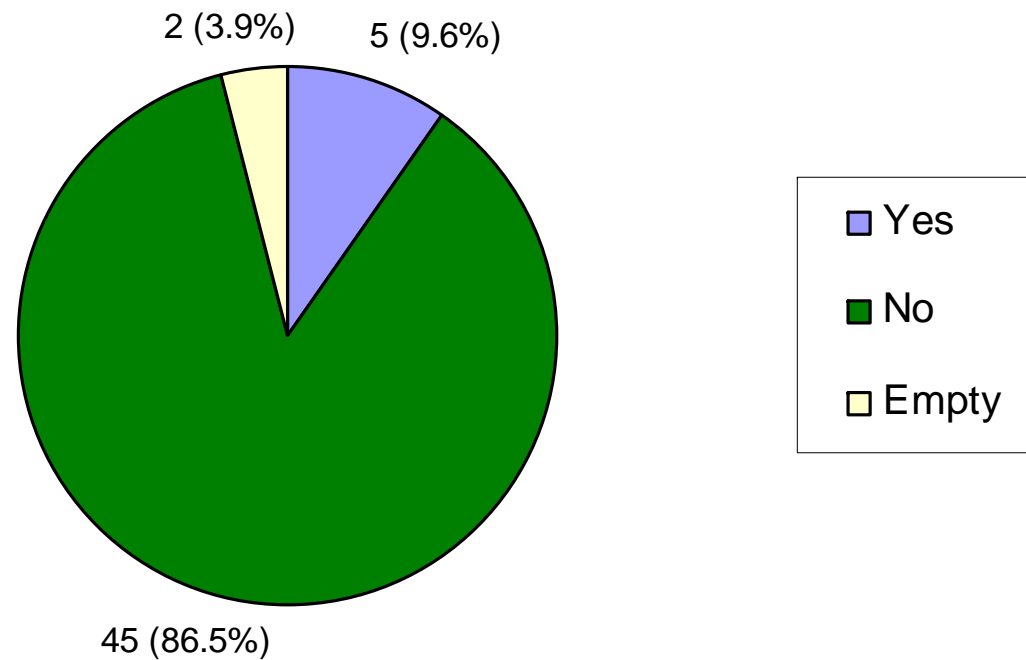


Identify common elements and differences (6)



Identify common elements and differences (7)

Courses in other languages



NATIONAL REPORTS

Work related to National Reports

The results of the European survey were the base of the National Reports (2th year).

Not all the National Reports were done before the limit date May 1st. However, due to a general delay, the WG1 University Coordinator (Polytechnic University of Madrid) decided to request for a full time student on grant that could help in the National Report finalization, specially to this country that did not complete his National Report.

Therefore, these reports were presented to the participant members in the WG1 Meeting (Antwerp (Belgium), September 10 - 11, 2004) as well as a document explaining the methodology and steps carried out in the realization.

National Reports Agreements

- Compile the European Countries Questionnaire to a digital and more attractive format ([Europe questionnaire](#)). So in the case of receiving new answers, they could be included in a new database.
- Send the standard National Report to the contact person that filled the questionnaires, to detect errors and misinterpreting of the information sent.
- Updating in the future the reports in the moment that changes take place, due to the influence that the continuous modifications are having in the curriculum reports in several European countries.

National Reports Problems

- Generally all the questionnaires curricula were filled in including the hours / week of each group of subjects and without providing the ECTS curriculum.
- In fact, it was easier to see differences between programmes considering the ECTS academic charge. So, it was necessary a revision of the curriculum in the web.
- However, in special cases some institutions did not have available the curriculum in the Net or just the ECTS charge for each group of subject. The solution was to deduce approximately this value knowing the equivalence between credits and hours, and comparing the hours / week with the total of ECTS in the programme
- Due to changes in subjects of the curriculum or in the programme, some data have been updated according to the recent information published in the web site.

NATIONAL REPORTS

Austria

Belgium

Bulgaria

Czech Republic*

Finland

France (Example)

Germany*

Hungary*

Ireland

Italy

Lithuania

Norway*

Portugal

Romania

Slovakia

Slovenia

Spain*

United Kingdom

Turkey

INTERNATIONAL REPORTS

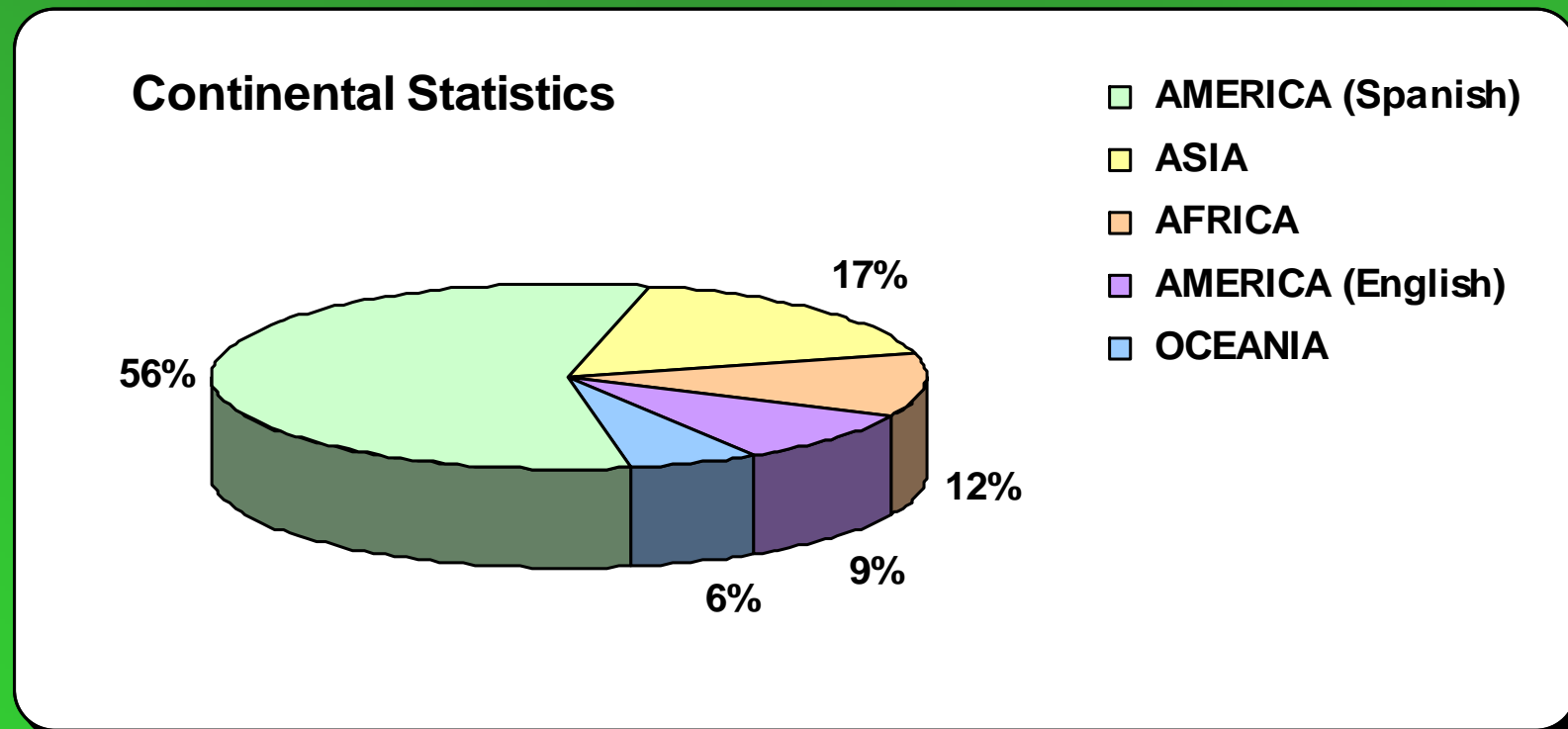
Work related to International reports on study systems out of Europe

After the collecting of information about European institutions and the National Reports, one of the activities planned for the second year was to collect similar information about study systems of countries in other continents, enriching the content of the database.

The questionnaire approved for this task, linked to a database, was presented in digital format in WG1 meeting not only in English (InternationalEnglishQ), but also in Spanish for South American people (InternationalSpanishQ).

Work related to International reports on study systems out of Europe (2)

This Questionnaire was sent to international institutions from all around the world and in spite of the poor number of answer checked, the international reports of each country were made. The graphic is a statistic of contacts and countries that received the questionnaire:



INTERNATIONAL REPORTS (Countries)

AMERICA (Spanish)		ASIA		AFRICA		AMERICA (English)		OCEANIA	
Argentina	25	Armenia	2	Algeria	1	Canada	3	Australia	6
Brasil	8	Bahrain	1	Botswana	2	Jamaica	2	New Zealand	4
Chile	23	Brunei	1	Burkina Faso	1	Trinidad & Tobago	2	Papua New Guinea	2
Colombia	11	Cambodia	1	Cameroun	1	U.S.A.	12		
Costa Rica	5	China	2	Egypt	1			Total Contacts	12
Cuba	2	Hong Kong	3	Ghana	3	Total Contacts	19		
Ecuador	4	India	2	Kenya	2				
El Salvador	3	Indonesia	1	Morocco	2				
Guatemala	3	Japan	1	Namibia	1				
Honduras	1	Jordan	1	Nigeria	2				
México	9	Saudi Arabia	1	Rwanda	1				
Nicaragua	1	Korea	2	South Africa	2				
Panamá	3	Lebanon	2	Tanzania	1				
Perú	5	Malaysia	2	Tunisia	1				
Puerto Rico	2	Mongolia	3	Zambia	2				
Uruguay	5	Nepal	2	Zimbabwe	1				
Venezuela	7	Russian	2						
		Singapore	3	Total Contacts	24				
Total Contacts	117	Sri Lanka	1						
		Syria	1						
		Turkey	1						
		Vietnam	1						
		Total Contacts	36						

INTERNATIONAL REPORTS (Answers)

Finally, at middle June the international reports started to be completed in a few countries:

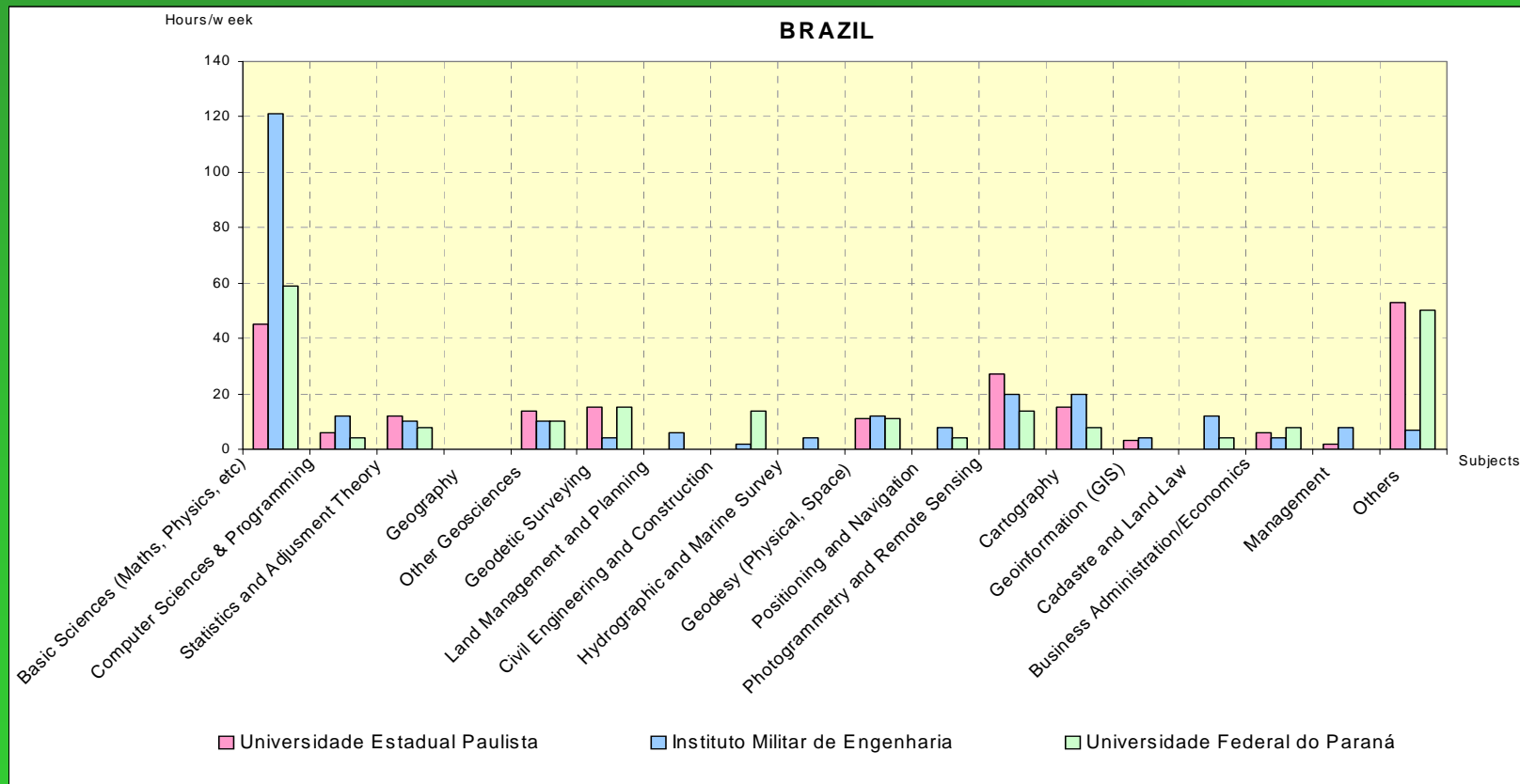
AMERICA (Spanish)		ASIA		AFRICA		AMERICA (English)		OCEANIA
Argentina	6	Turkey	1	Morocco	1	Canada	2	Total Contacts
Chile	5	Total Contacts	1	Total Contacts	1	U.S.A.	2	
Brazil	3					Total Contacts	4	
Colombia	1							
Costa Rica	1							
Ecuador	1							
Total Contacts	17							

INTERNATIONAL REPORTS FEATURES

1. Approximated relationship within the country surface, number of citizens and the number of the national institutions
2. Analysis between the number of contacts asked and the answer received
3. Table with the main features of each institution:
 - Name of the programme
 - Degree and specializations
 - Duration of the programme
 - Requirements to enter
 - Diploma Supplement
 - Credit System
 - Compulsory practical training.
 - Curriculum available in the web site

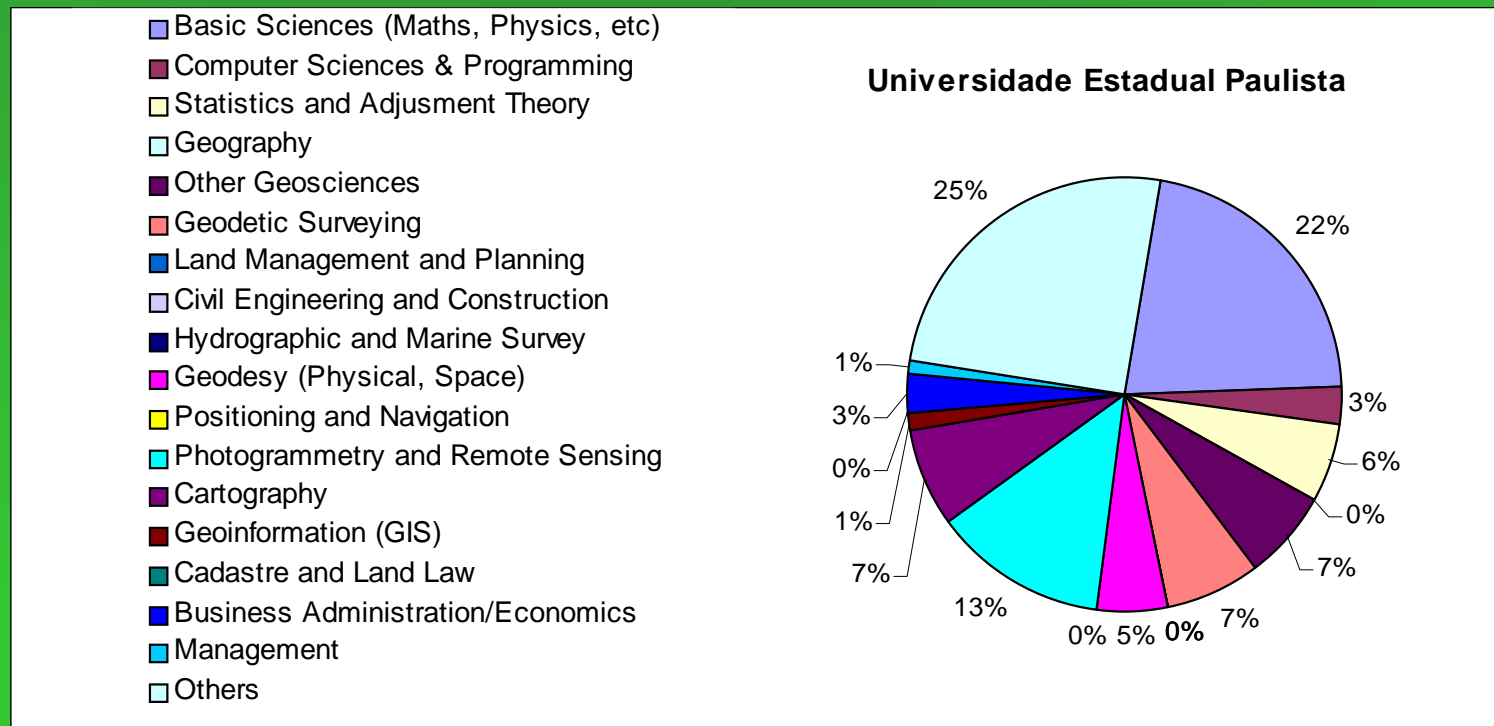
INTERNATIONAL REPORTS FEATURES (2)

4. With a **Bar diagram** it was compared the number of hours/week (not in credit system) assigned to each group of subject within the national institutions.



INTERNATIONAL REPORTS FEATURES (3)

5. Similarly, with **Circular diagrams** was contrasted the percentage associated to each group of subject from the total hours of the institution curriculum.



INTERNATIONAL REPORTS FEATURES (4)

6. Brief analysis of the actual situation in the country and some conclusions in sight of:

- the general features table
- the graphics; it were emphasized the most important groups of subjects in each degree

INTERNATIONAL REPORTS

Argentina

Brasil

Chile (Example)

Colombia

Costa Rica

Ecuador

Moroco

Canada

USA

Australia

New Zealand

Survey on working groups (3rd year)

A preliminary list of international associations were placed to the WG1 site. To complete this list all the members were asked to send their proposals or/and the name of representatives from different associations.

Each colleague was demanded to prepare a brief report summing up the obtained information about the activities of the group .

The final result of this task was a General Report based on these brief reports.

Survey on working groups

The questionnaire ([Institutions Questionnaire English](#)) made for this task, linked to a database, was translated to Spanish for South American people ([Institutions Questionnaire Spanish](#)).

Questions about:

- General features
- Field of work
- Activities
 - Seminars
 - Congresses
 - Meetings
- Specialization or Non official degrees
- Relevant stage of groups of subjects for a future curriculum

Survey on working groups

Not all the National Reports were done by the WG1 members.
The student on grant helped the group to complete the study.

- AUSTRIA
- BELGIUM
- BULGARIA
- CZECH
- DENMARK
- FINLAND
- FRANCE
- GERMANY*
- GREECE
- HUNGARY
- IRELAND
- ITALY
- LITHUANIA
- LUXEMBOURG
- NEATHERLANDS
- NORWAY*
- POLAND
- PORTUGAL
- ROMANIA
- SLOVAKIA*
- SLOVENIA
- SPAIN*
- SWEDEN
- TURKEY
- U. K.



**“OPENING DOORS TO LEARNING AND
WORKING IN EUROPE”**

What is Europass:

Europass is a new way of helping people to make their skills and qualifications clearly and easily understood in Europe (European Union, European Free Trade Association, European Economic Area, and candidate countries), and move anywhere in there.

europass

Summary

- **What is Europass**
- **The History of Europass**
- **The Europass Structure**
- **Europass Curriculum Vitae**
- **Europass Language Passport**
- **Europass Mobility**
- **Europass Certificate Supplement**
- **Europass Diploma Supplement**
- **The Europass for...**
- **National Europass Centres**
- **National Reference Points for vocational qualifications**

References :

EUROPASS Official Website:

<http://europass.cedefop.eu.int/>

(more information, downloads, examples...)

europass



*“European Education in Geodesy,
Cartography & Surveying
Historical development of the Faculties & Titles”*

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Higher School of Surveying, Geodesy and
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European Education in Geodesy, Cartography & Surveying
Historical development of the Faculties & Titles

Summary

- **Intro Europe history**
- **The Italian Tradition**
- **European Situation: Introduction**
- **University & Faculty: Types**
- **University & Faculty: Evolution**
- **Bachelor & Master in Europe**
- **Bachelor: Names & Duration**
- **Bachelor Fields**
- **Master Programs in Europe**
- **Master: Names & Duration**
- **Master Fields**
- **Conclusions**

European Study

Search Criteria:

- Only the information provided by the NET was considered
- European Countries and EU countries that include some Undergraduate or Postgraduate programme from the groups of subjects related with the EEGECS Thematic Net:
 - Geomatics
 - Surveying
 - Hydrographics
 - Mining Surveying
 - Land Management & Planning
 - Geodesy
 - Positioning and Navigation
 - Photogrammetry & Remote Sensing
 - Cartography
 - GIS
 - Cadastre & Real Estate...

European Education in Geodesy, Cartography & Surveying
Historical development of the Faculties & Titles

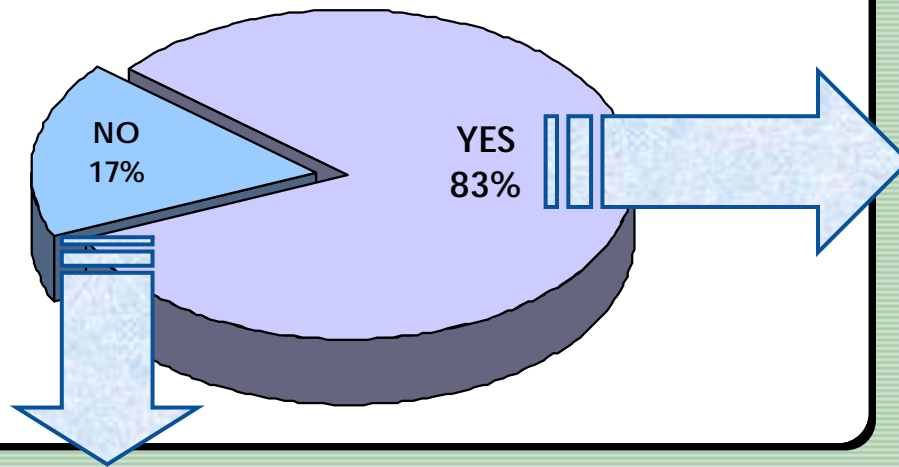
European Study

Search Criteria:

- Faculties or Schools or Departments in those Universities from the Countries included above (one University can include several Faculties in the survey)
- History and Tradition of the Faculties (Historical Evolution)
- Bachelor and Master Titles or programmes by:
 - COUNTRY
 - NAME
 - DURATION
 - FIELD
- Great European Countries Comparison (The European Countries of the G8)
- The Italian Situation

European Situation: Introduction

European Continent Situation

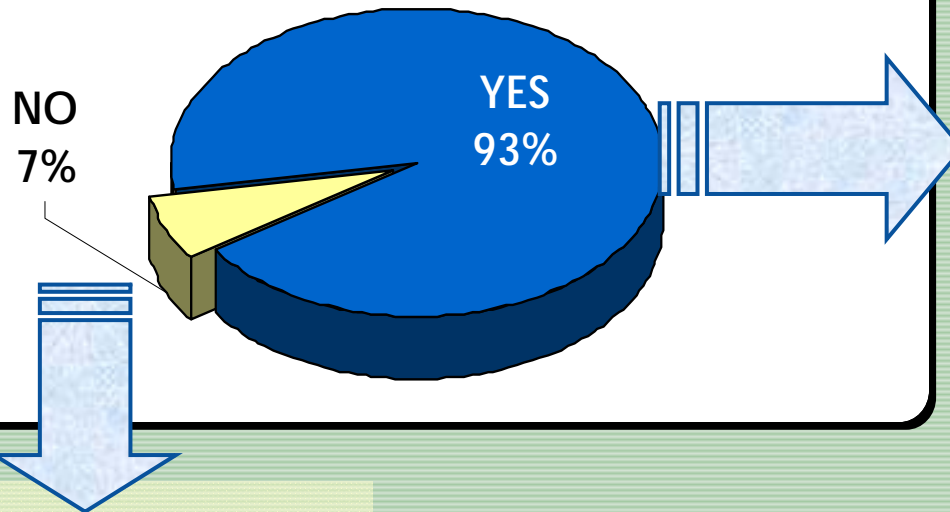


- ISLAND
- ARMENIA
- AZARBAIJAN
- ANDORRA
- MALTA
- MONTENEGRO
- CYPRUS
- LIECHTENSTEIN

- ALBANIA
- AUSTRIA
- BELARUS
- BELGIUM
- BOSNIA-HERZ.
- BULGARIA
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European Situation: Introduction

European Union* Situation

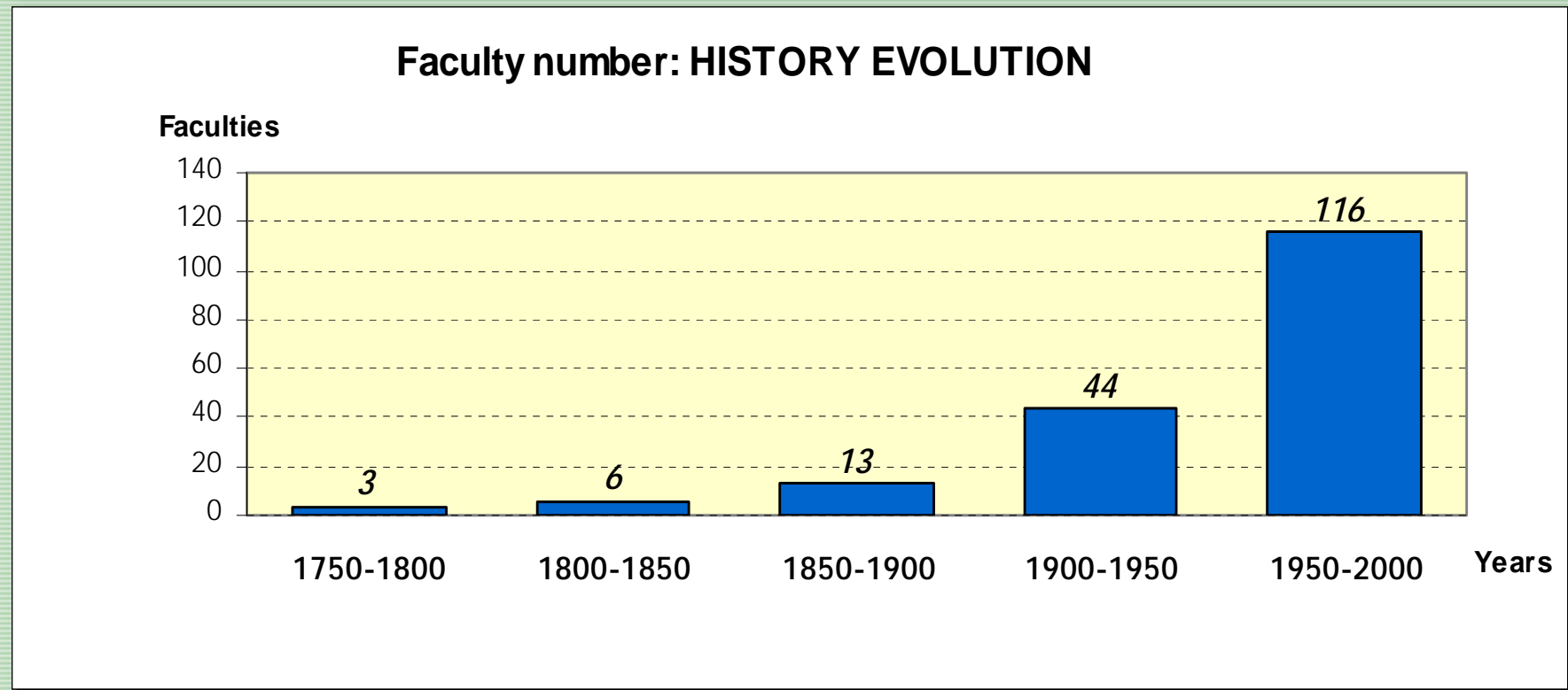


- MALTA
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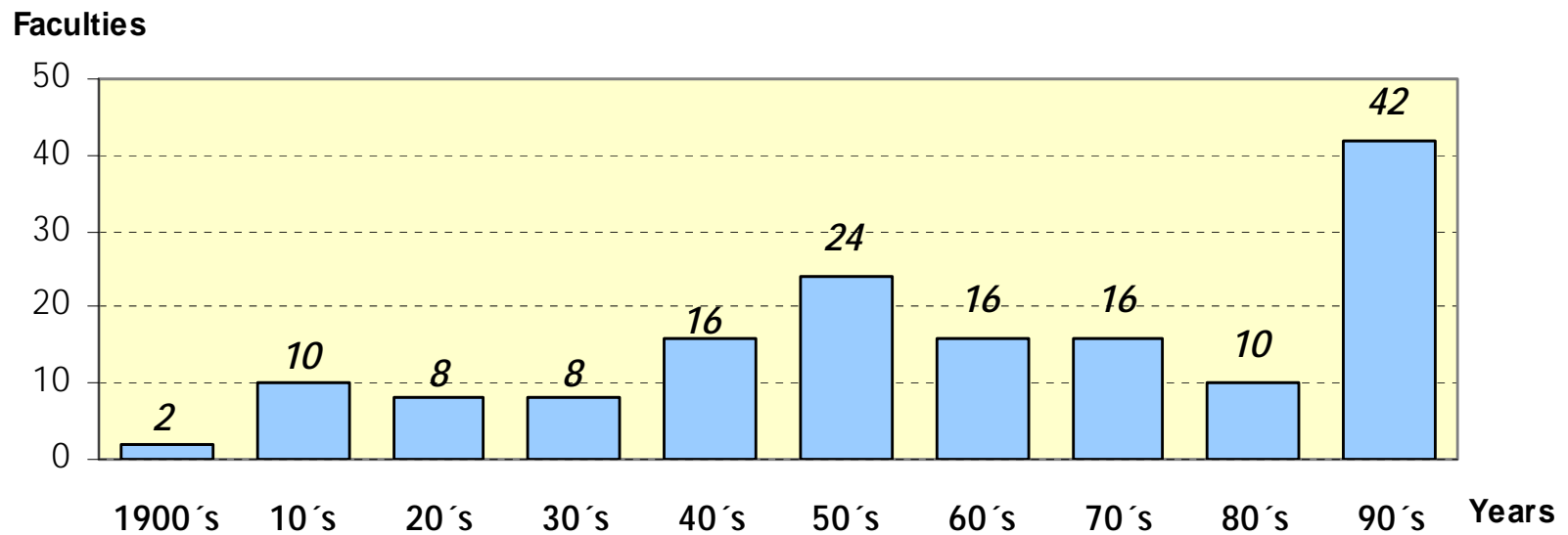
*Applicant countries are included

Universities & Faculties: EVOLUTION

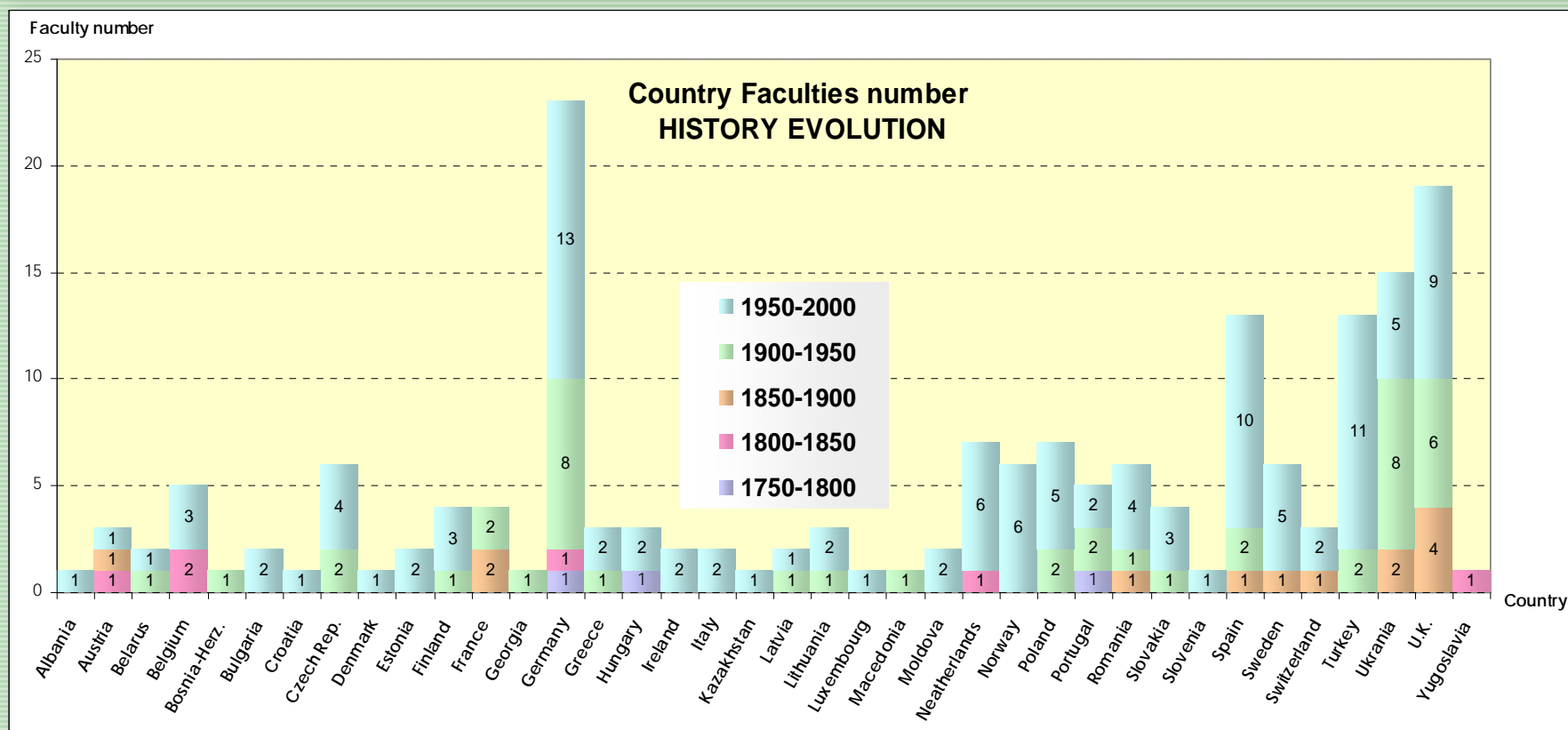


Universities & Faculties: EVOLUTION

Faculty number: 20th CENTURY

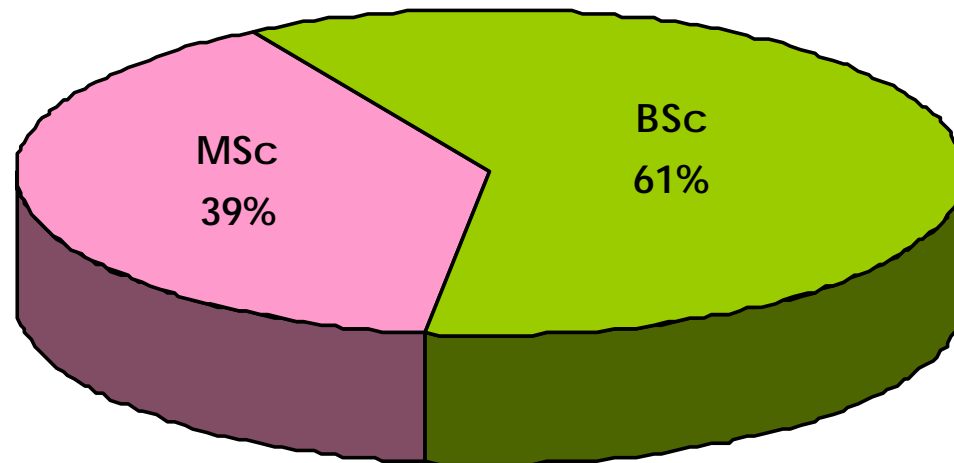


Universities & Faculties: EVOLUTION



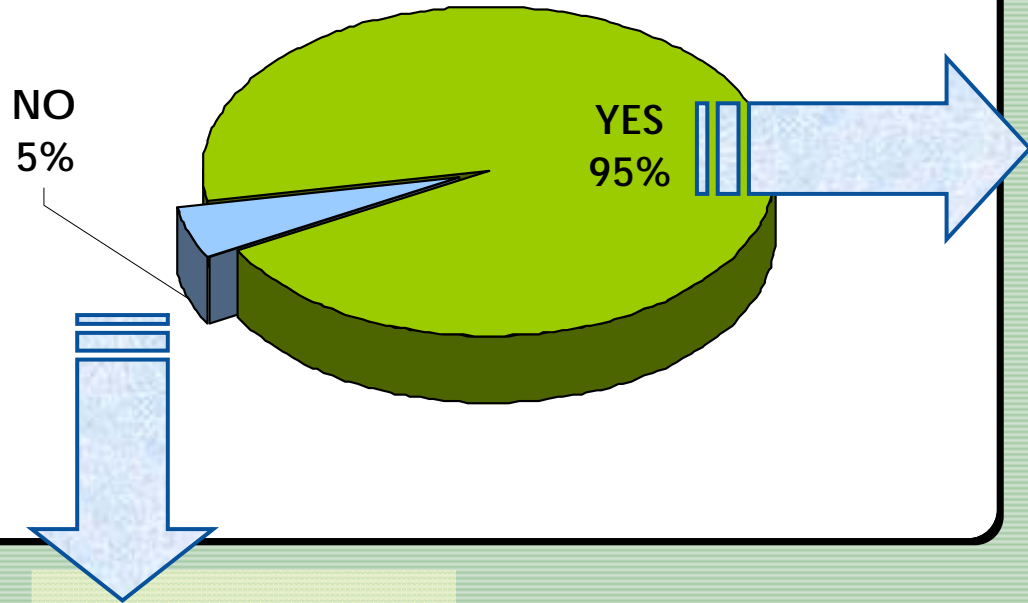
Bachelor & Master in Europe

European Programs Distribution



Bachelor in Europe

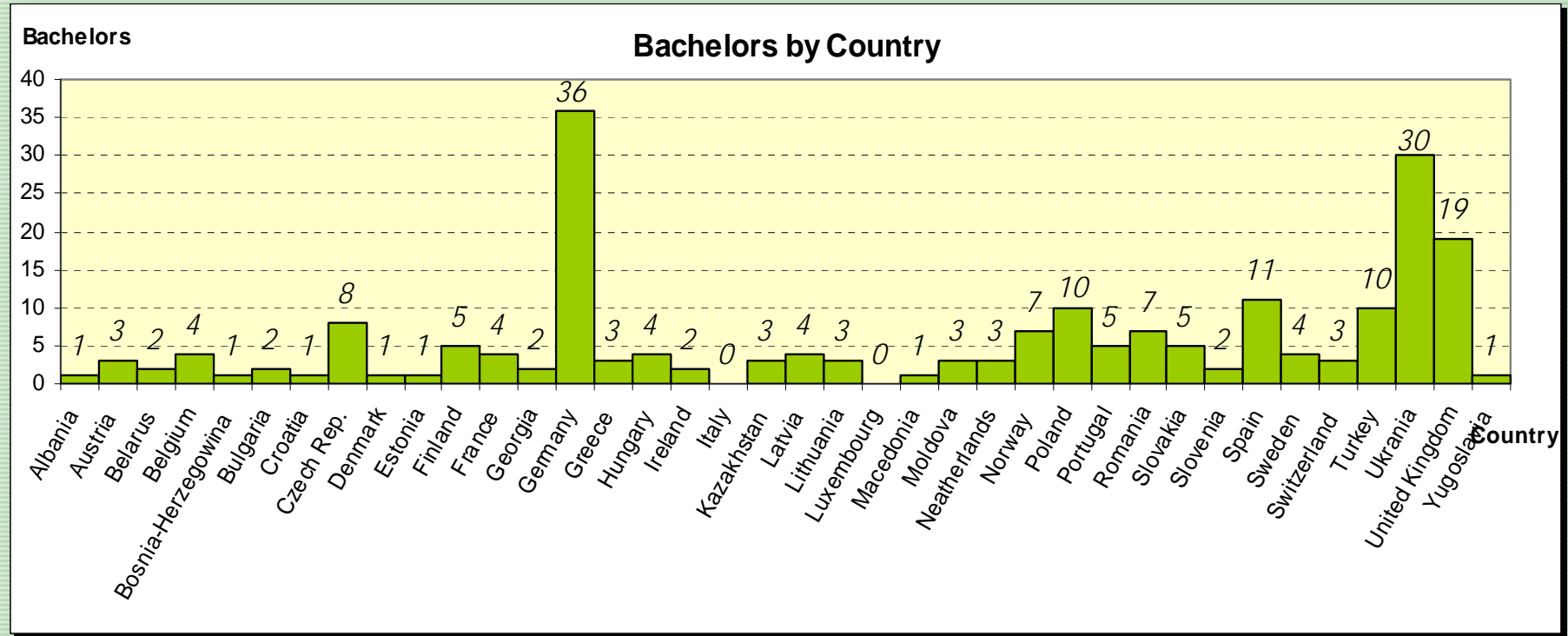
BACHELOR - European Continent



- ITALY
- LUXEMBOURG

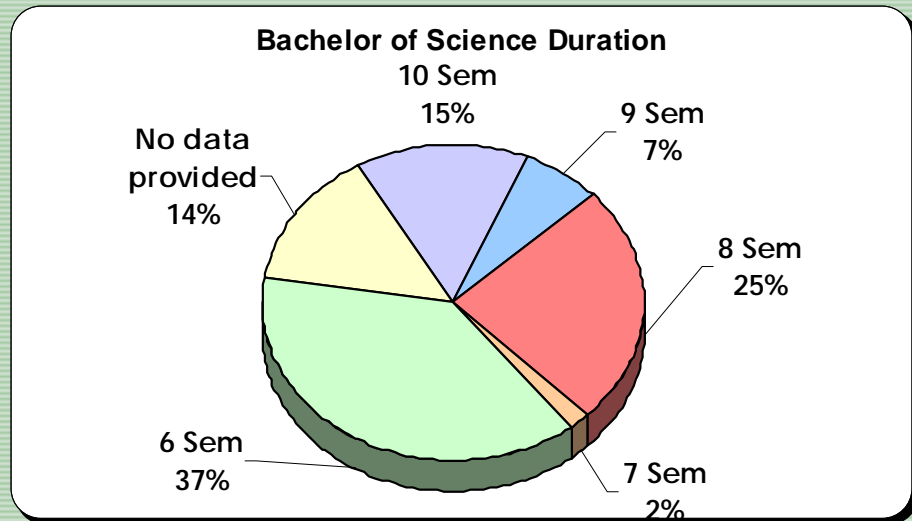
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Bachelor: European Distribution



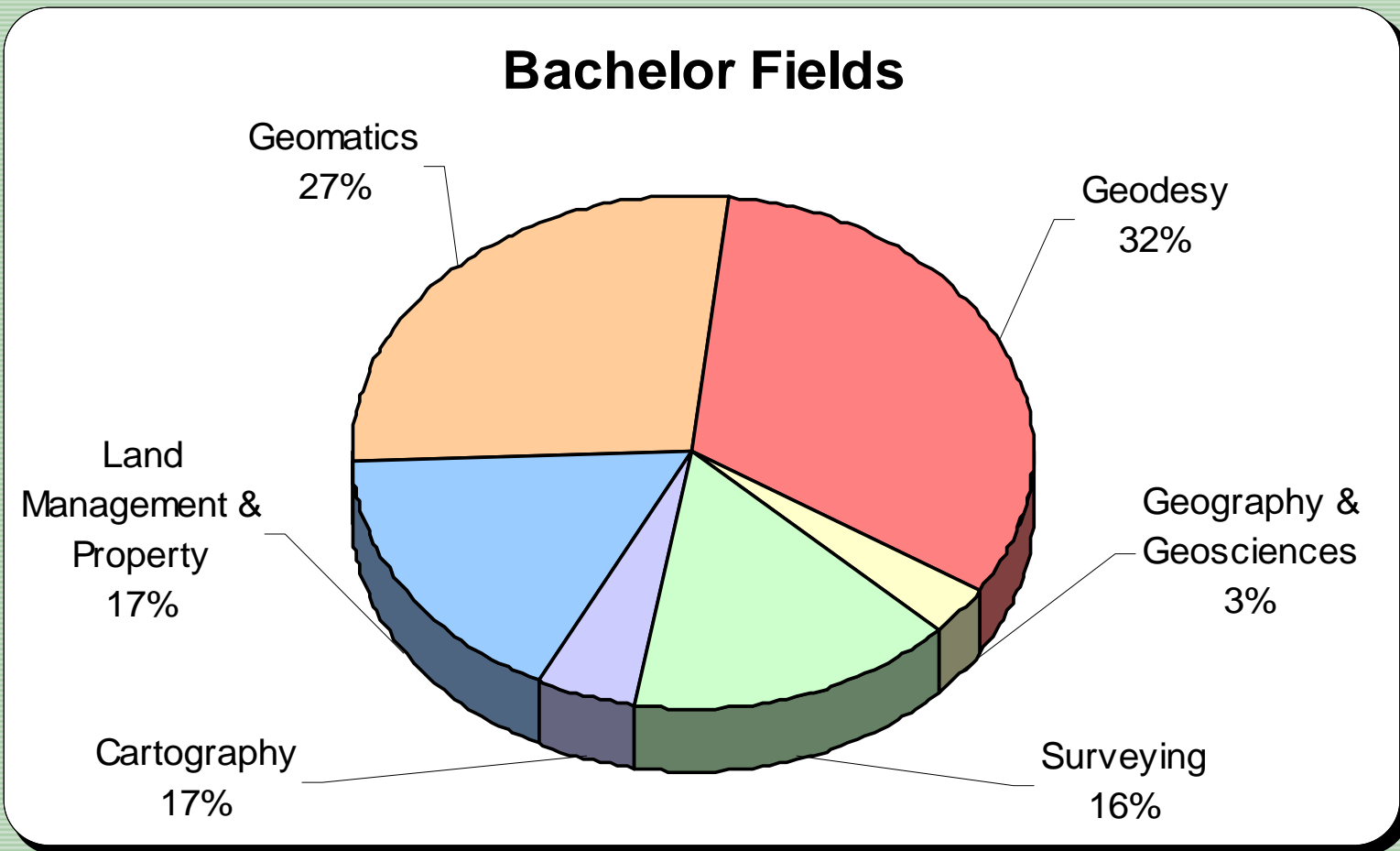
Bachelor: Programmes & Duration

Cadastré	2
Cartography	6
Cartography & Land planning	2
Cartography & Surveying	4
Earth Observation and Technology	1
Geodesy	32
Geodesy & Cartography	10
Geodesy & Cartography & Cadastré	2
Geodesy & Geomatics*	7
Geodesy & Photogrammetry	10
Geodesy & Real Estate	1
Geodesy & Surveying	2
Geodesy, Cartography & Land planning	2
Geodesy, Surveying & Cartography	1
Geography & Cartography	3
Geography & Geomatics*	3
Geomatics*	34
Geomatics* & Cartography	3
Geomatics* & Surveying	9
GIS	10
Industrial Engineering (Geodesy)	2
Industrial Engineering (Surveying)	2
Land planning	7
Land planning & Cadastré	17
Mine Surveying	7
Real Estate	10
Surveying	22
TOTAL	211

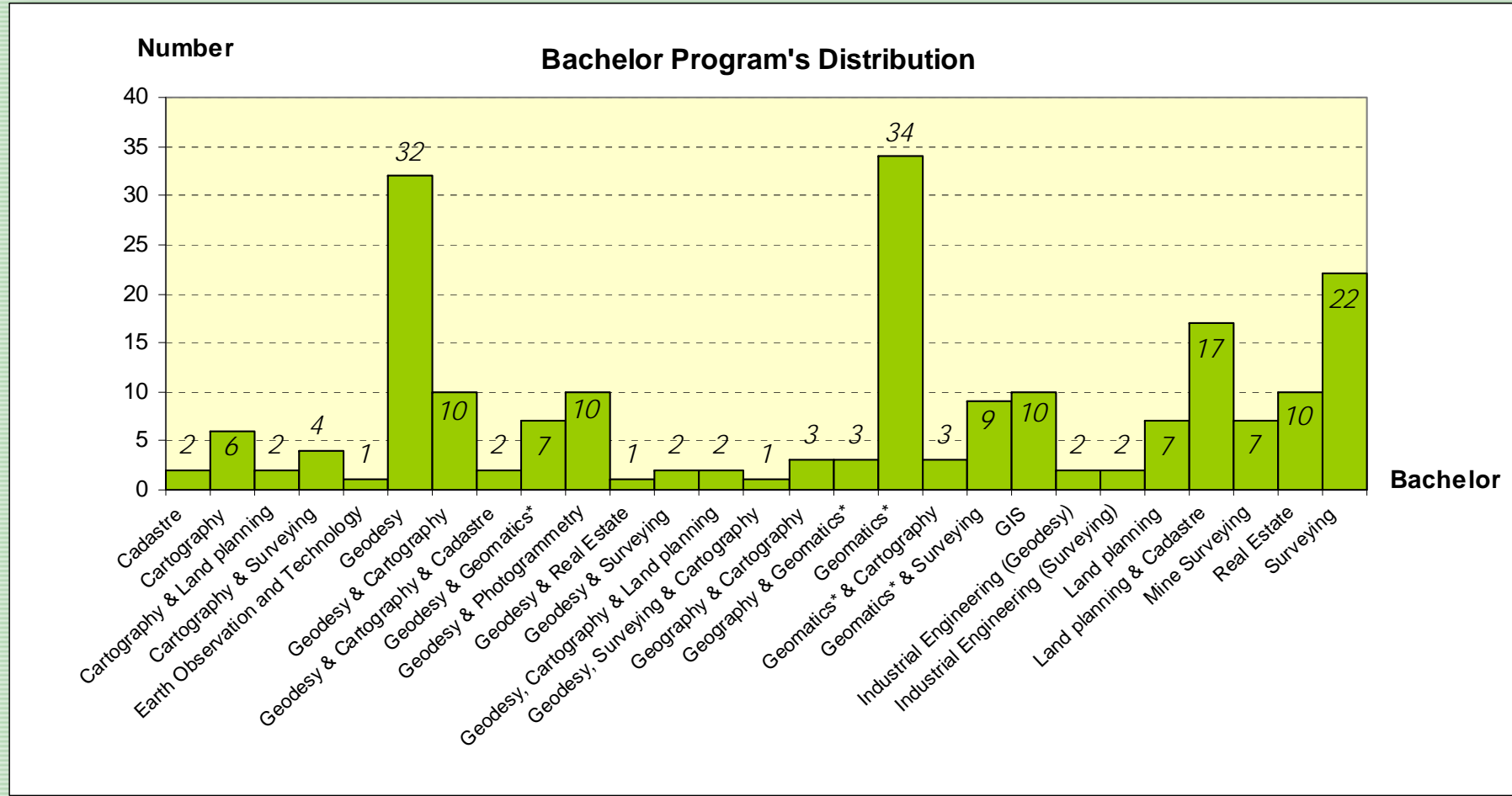


*Geomatics includes the term
Geoinformation

Bachelor Fields

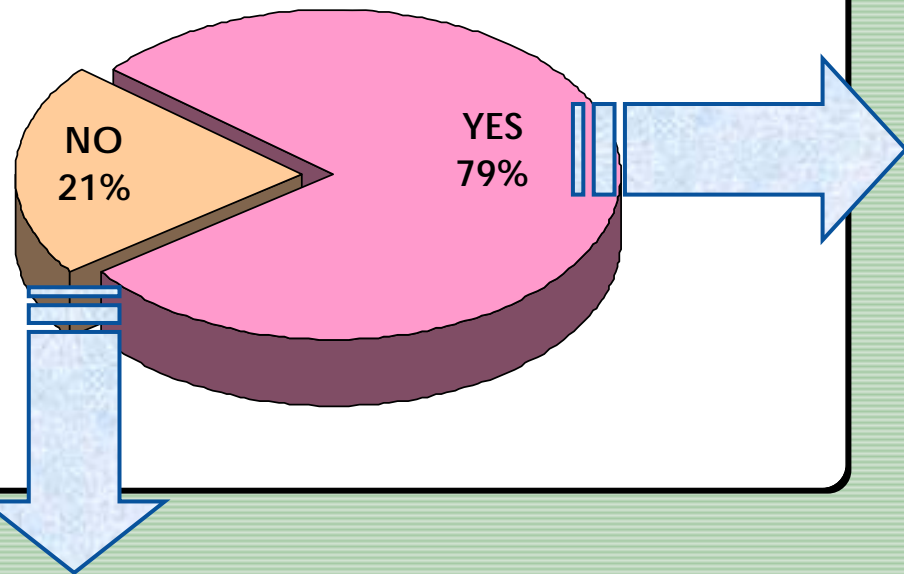


Bachelor: Programme Names



Master in Europe

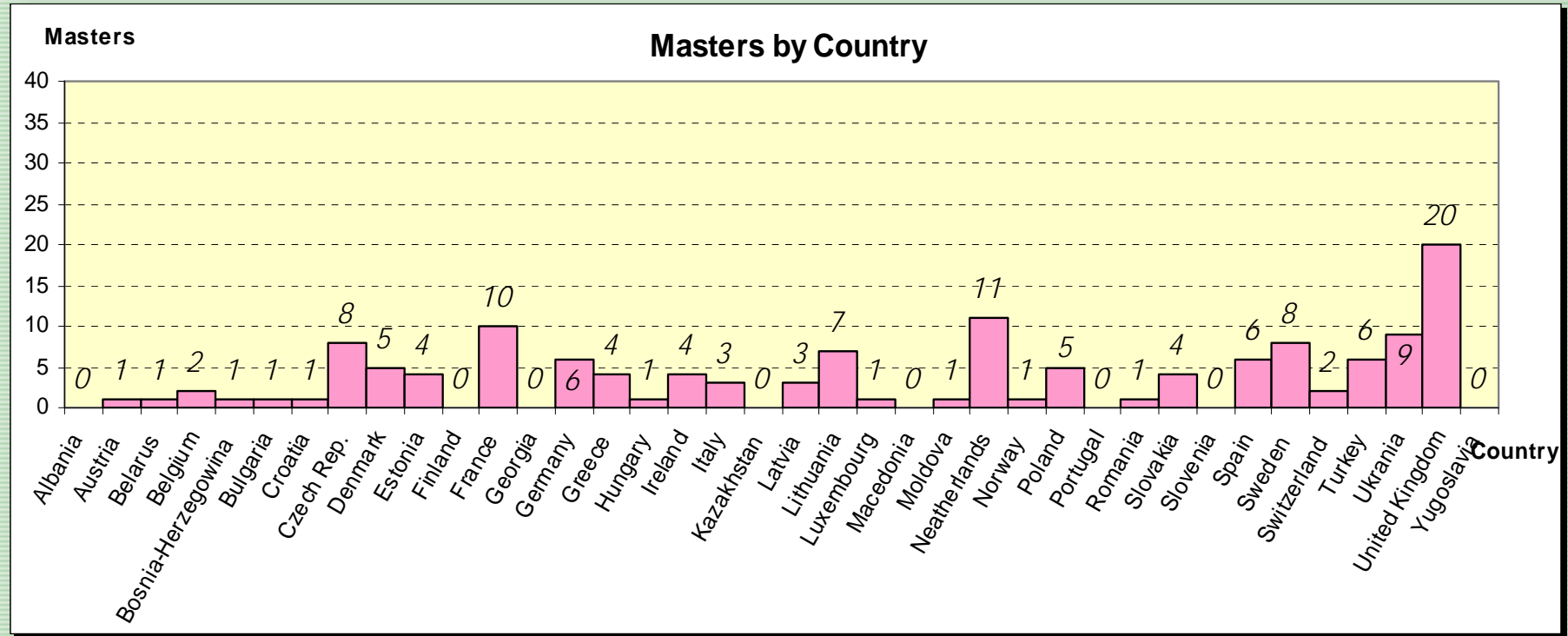
MASTER - European Continent



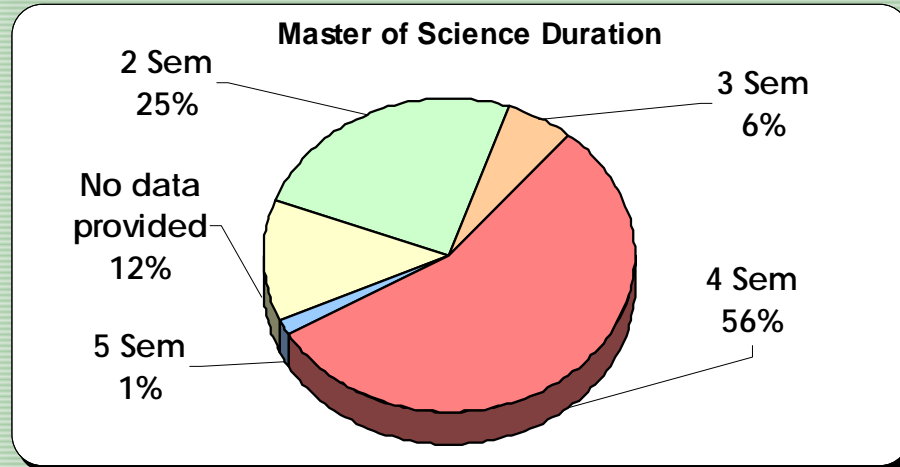
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Master: European Distribution



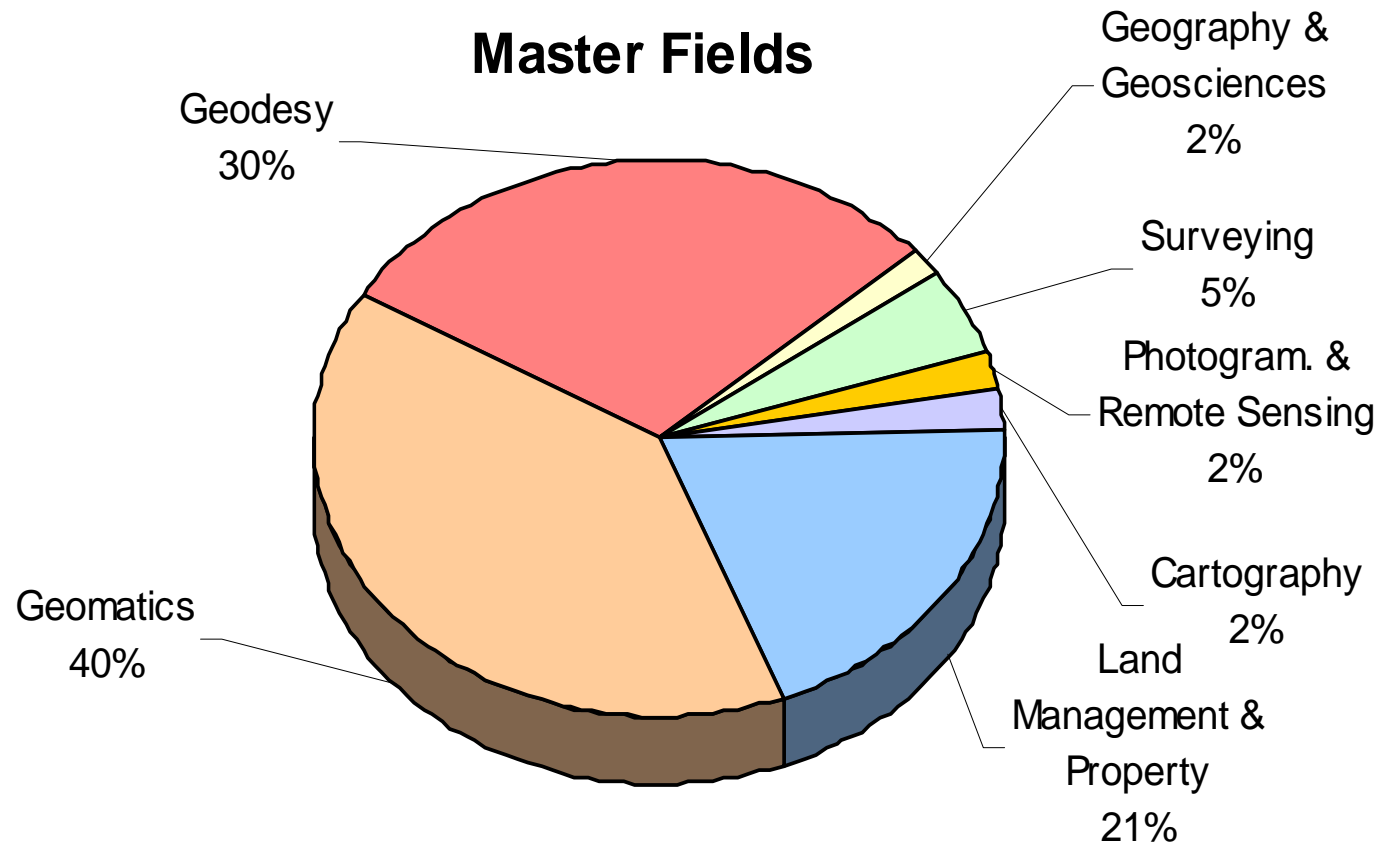
Master: Programmes & Duration



*Geomatics includes the term
Geoinformation

Cadastre	2
Cartography	2
Earth Observation and Technology	2
Geodesy	13
Geodesy & Cartography	13
Geodesy & Geomatics*	2
Geodesy & Mine Surveying	1
Geodesy & Surveying	1
Geodesy and Photogrammetry	4
Geography & Cartography	2
Geomatics*	32
Geomatics* & Photogrammetry	1
Geomatics* & Surveying	2
GIS	15
Hydrographic Surveying	2
Land planning	11
Land planning & Cadastre	6
Mine Surveying	2
Photogrammetry	1
Photogrammetry & Remote Sensing	1
Real Estate	8
Remote Sensing	1
Satellite Navigation	3
Surveying	4
TOTAL	131

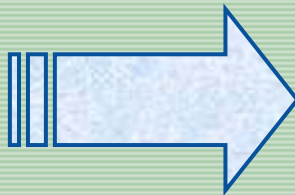
Master Fields



The Great European Countries

- How is the situation between the European Countries and the G8 countries?

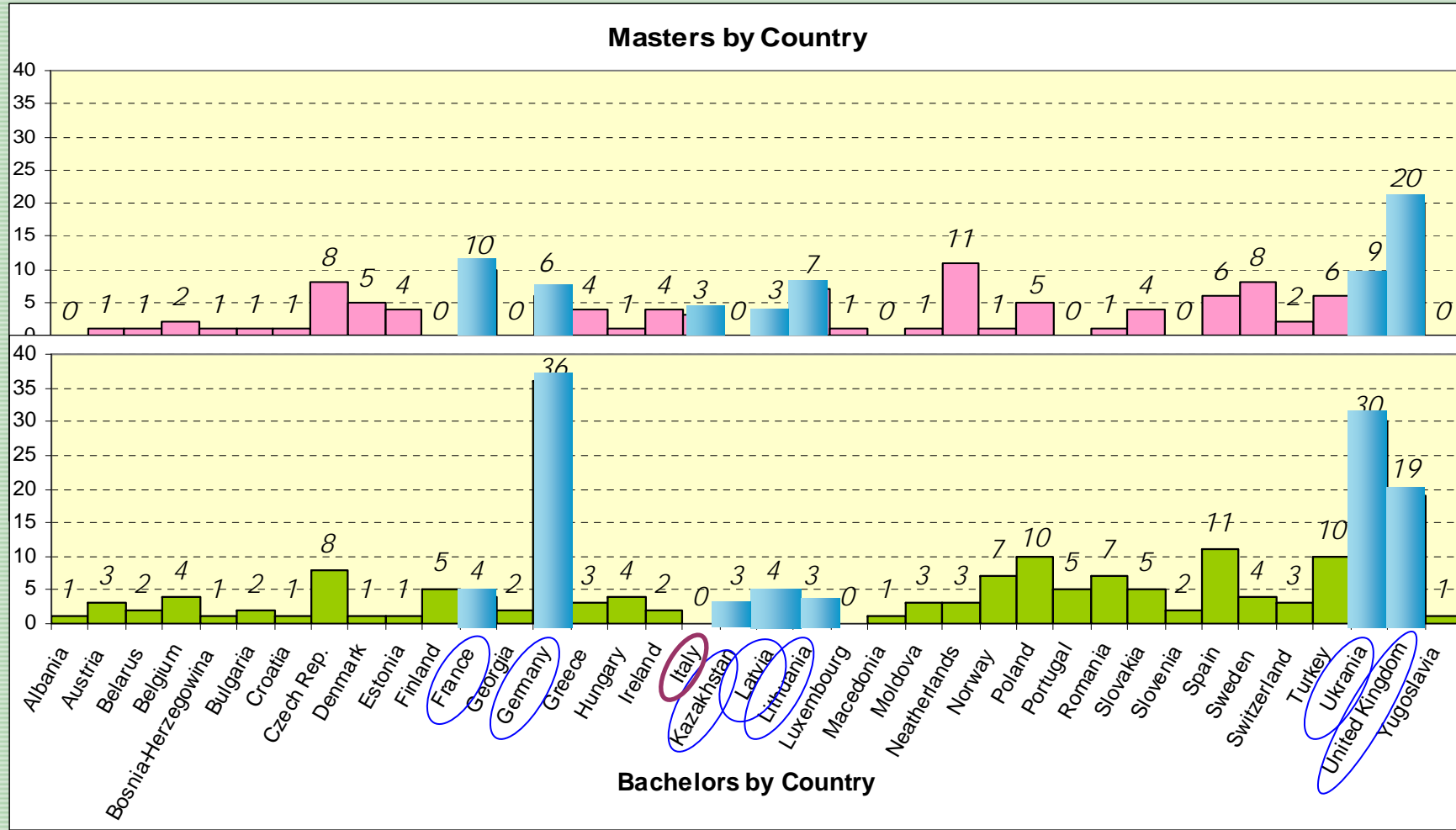
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- JAPAN
- CANADA
- ITALY



- FRANCE
- "EUROPEAN RUSIA"
(The URSS Countries)
- GERMANY
- U.K
- ITALY

European Education in Geodesy, Cartography & Surveying

Historical development of the Faculties & Titles



Conclusions

- The majority of Europe countries start a strong education in Geodesy (BSc in Geodesy) and next a Geomatics specialization (MSc in Geomatics)
- Italy include some MSc in Geomatics as the majority of Europe but has not a primary education in Geodesy

Conclusions

- In general, the objectives have been successfully reached. However, not all the tasks have been completed. In spite of that, some tasks of the first year have been improved and an other one has been added.
- The delay in some activities planned is not a consequence of the working group; it is just a lack of results of others research groups.

Conclusions (2)

- The results of the reports made by the working group has been used by the Commission formed by members of Spanish educational institutions specialized in these specific subjects, that have elaborated the "White Book" of the future study programme in Surveying and Geomatics Engineering, according to the aims of the Declaration of Bologna.
- Due to the changes in the curricula by the consequences of the Bologna's aims, it will be necessary to update the studies carried out in education by the working group.
- Otherwise, it would be necessary a recognition of the activities of the Net by the educational authorities, as investigational activities due to the time that its involve.

PHOTOS



PHOTOS



THANK YOU VERY MUCH

EUROPEAN EDUCATION IN GEODETIC
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State of the Art of Issues related to
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Results of the 3-years operation of the
EEGECS network: Working Group 1
(Undergraduate education)

Athens, Greece 30 November – 1 December 2006

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