

# **European Education in Geodetic Engineering, Cartography and Surveying - Skills of graduates required by European enterprises**

**Erwin Heine & Gert Steinkellner**  
**Andrej Messner & Emmanuel Natchitz**  
**Budapest, Hungary**  
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## Overview

- **The Bologna Process**
- **The project EEGECS: European Education in Geodetic Engineering, Cartography and Surveying**
  - **Skills of graduates required by European enterprises**

## The Bologna Process

Milestones:

- **1998: Sorbonne Declaration**
- **1999: Bologna Declaration**
- **2001: Prague Communiqué**
- **2003: Berlin Communiqué**
- **2005: Bergen Communiqué**
- **2007: London/ UK**

## Sorbonne Declaration (1998)

General principles:

- **Key role of universities in developing European cultural dimensions**
- **Context of mobility & employability of European citizens**

## Bologna Declaration (1999)

Main topics for a European Area of Higher Education:

- 1. Easy readable and comparable degrees**
- 2. A system based on two main cycles**
- 3. A system of credits**
- 4. Mobility**
- 5. European co-operation in quality assurance**
- 6. European dimensions in higher education**

signed by the ministers responsible for higher education

of 29 European countries

(constant support, supervision and adoption to current needs)

## Prague Communiqué (2001)

Additional points:

- 7. Lifelong learning is an essential element**
- 8. Involvement of higher education institutions and students**
- 9. Promotion of the attractiveness of the European Higher Education Area**

three new members welcomed to join the process

## Berlin Communiqué (2003)

Additional actions:

### **Two pillars of the knowledge based society:**

- **European Education Area and**
- **European Research Area**

### **Stocktaking: reports about**

- **Quality assurance**
- **two -cycle system and**
- **recognition of degrees and periods of studies**

expanding to 40 European countries

## Bergen Communiqué (2005)

Mid term review and goals towards 2010:

### Taking stock:

- **Implementation of two-cycle degree system**
- **Quality assurance systems**
- **National action plans**

### Further challenges and priorities:

- **Need for structured doctoral programmes**
- **Social dimension** (students from socially disadvantaged groups)
- **Mobility of students** (visa and work permits)



## The Project EEGECS

European Education in **Geodetic Engineering, Cartography and Surveying**

- **a thematic network started in 2002**
- **under the recommendations of the Bologna Declaration**
- **to enable graduates in GECS to work all over Europe**
- **to facilitate trans-national access to educational resources in Europe**
- **more than 100 institutions from 27 European countries**

## Working Groups 1-3

- **WG1 Undergraduate Education** enhance the dialog, promote the adoption of ECTS, elaborate a core curriculum
- **WG2 Research** create a European Research Area, promote to include the results into the undergraduate education
- **WG3 Continuous Education** promote the use of innovating teaching methods, create international master programmes

## Working Groups 4-6

- **WG4 Enterprises Private/Public sector analyse**  
the skills of graduates requested by European enterprises
- **WG5 Mobility, Languages, Culture promote**  
mobility of undergraduate students, scientific studies  
and language learning
- **WG6 Quality Assurance:** to increase the quality of  
teaching and to move towards a common accreditation  
system

## **Targets of WG 4 / Part 1**

- 1. Surveying of skills of GECS graduates  
demanded by the public and private enterprises**
- 2. Implementation of a network of enterprises disposed  
to employ graduates for practical training**
- 3. Comparing legal prerequisites  
to work as a chartered engineer in Europe**

**Targets of WG4 / Part 2 (not part of this presentation)**

- 4. Promotion of graduates' mobility and of research co-operation**
- 5. Information on Diploma Supplements in Europe**
- 6. Information on Financial Programs in Europe**

# Surveying of skills of GECS graduates

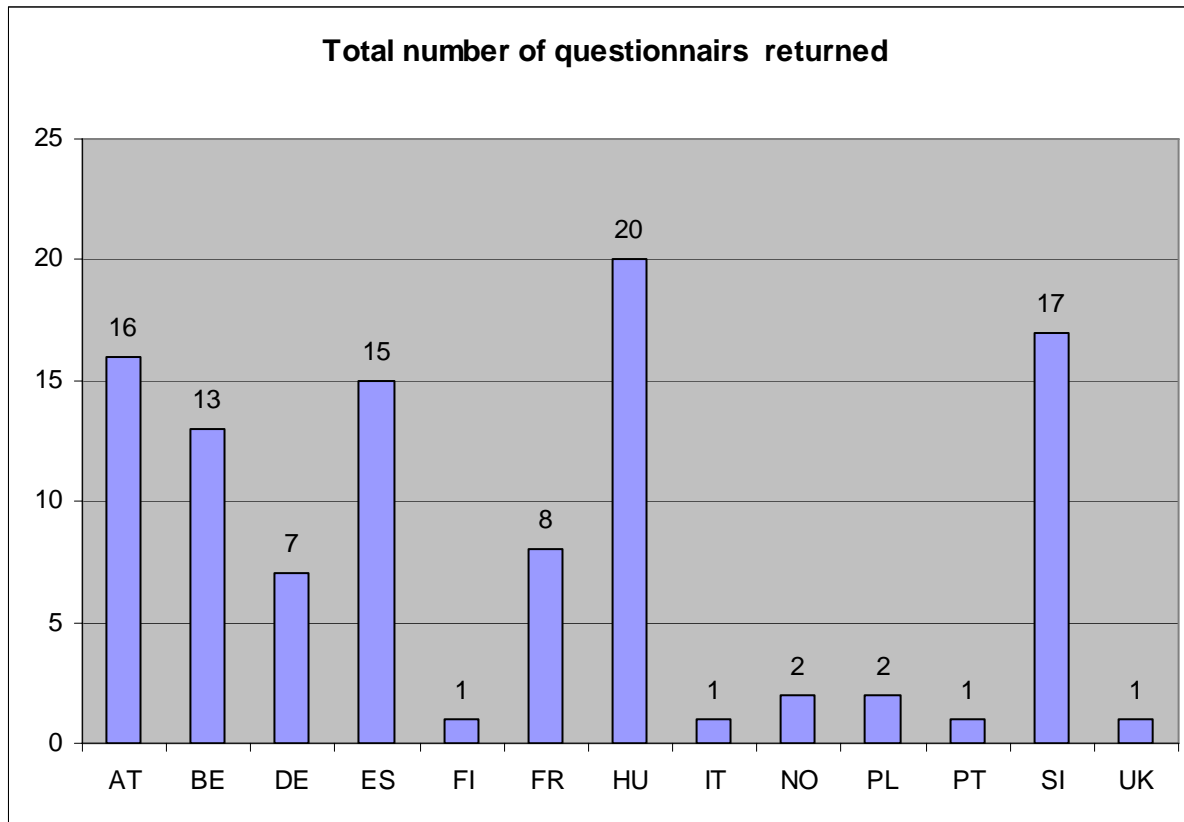
- web based  
or  
analog 4 page  
questionnaire

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## Questionnaire Target Groups

- **Private companies offering chartered engineers services**
- **Public institutions, working in the GECS sector**
  - **federal**
  - **central**
  - **regional or**
  - **municipal**

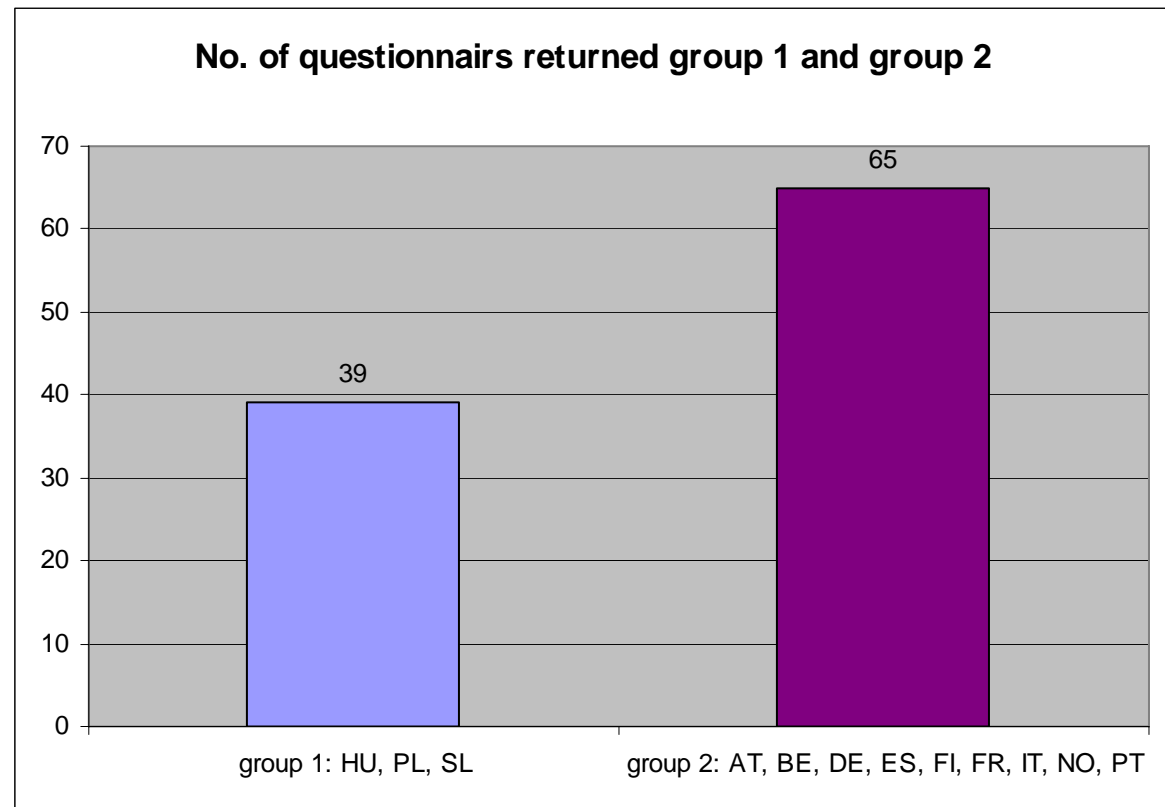
## Analysis of questionnaires / Response 1





## Analysis of questionnaires / Response 2

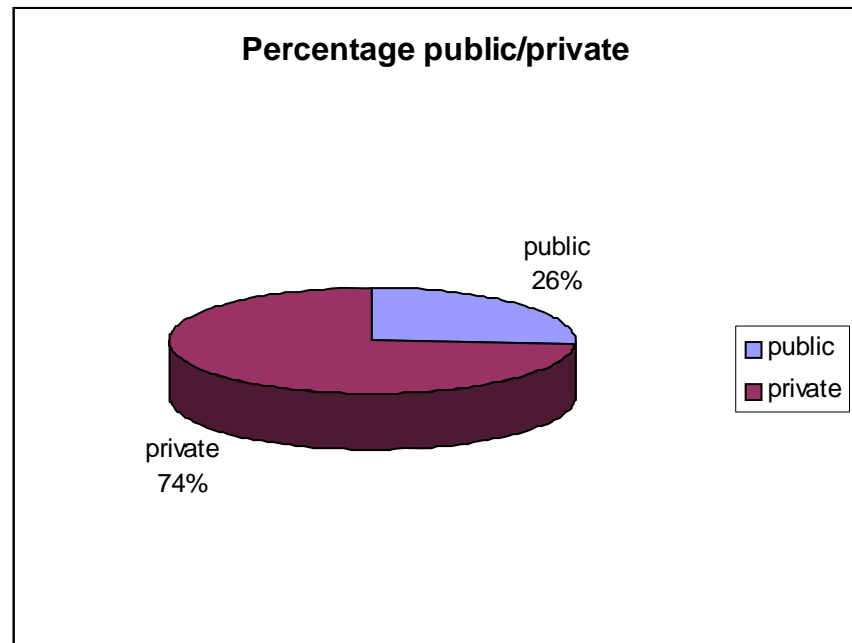
**Response from  
“new” EU  
members (HU,  
PL, SL)  
unexceptionally  
high!**



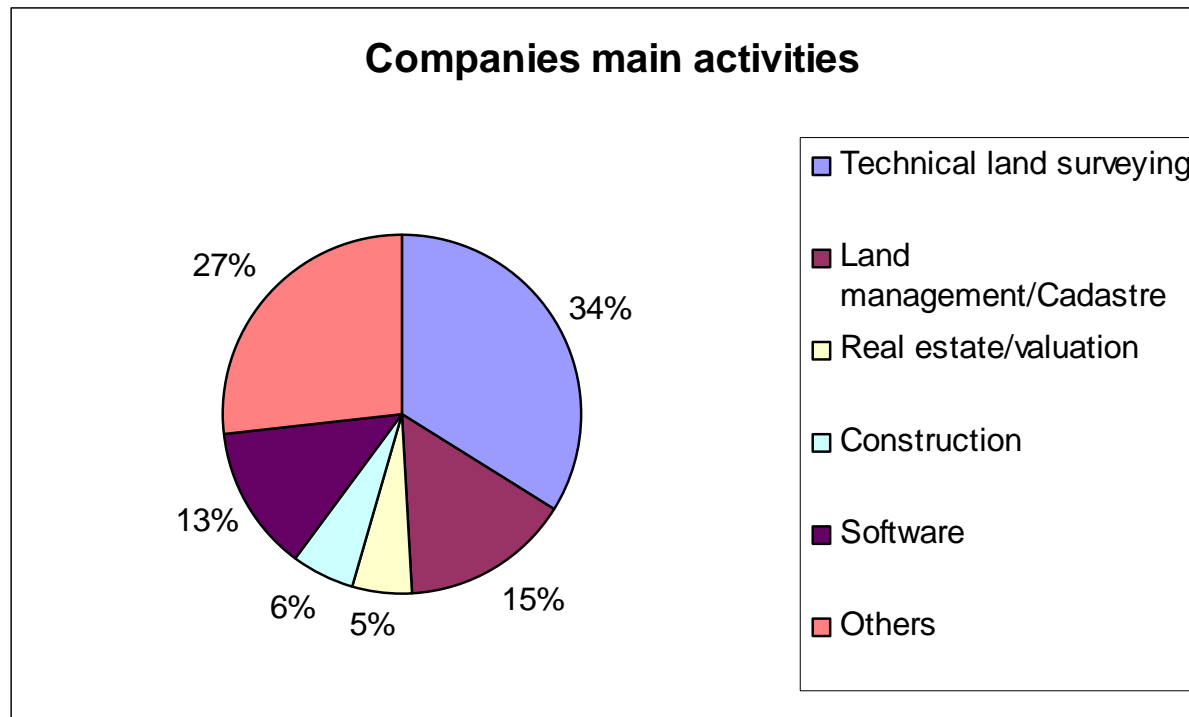
## Analysis of questionnaires / Segmentation of enterprises

**Segmentation of feedback reflects the focus on private companies:**

**Almost 75% private**

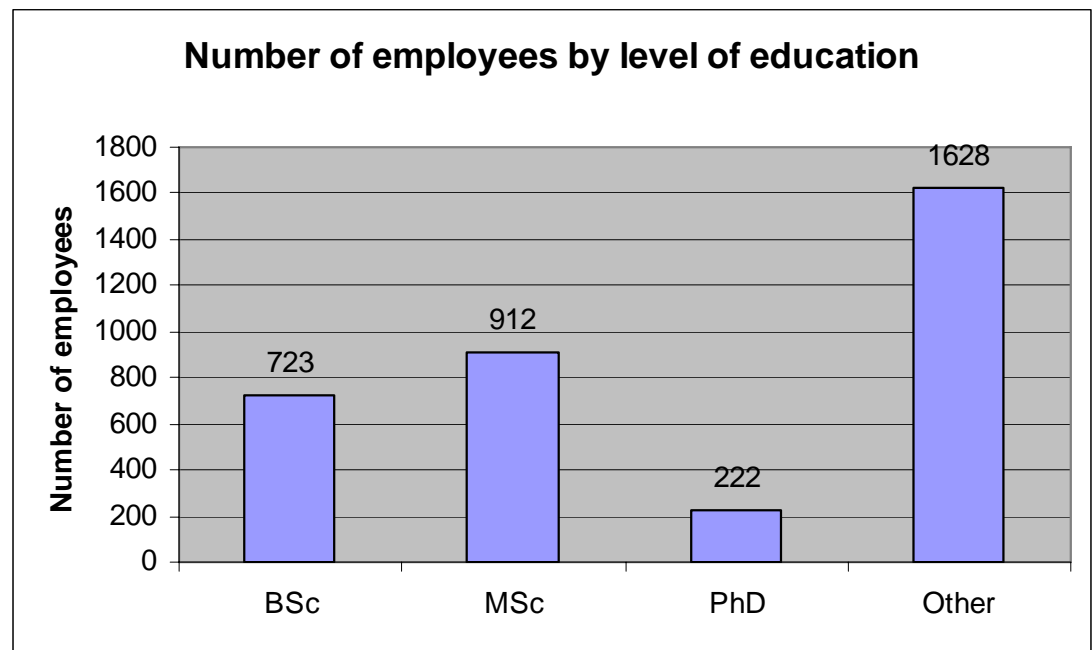


## Analysis of questionnaires/ Companies main activities

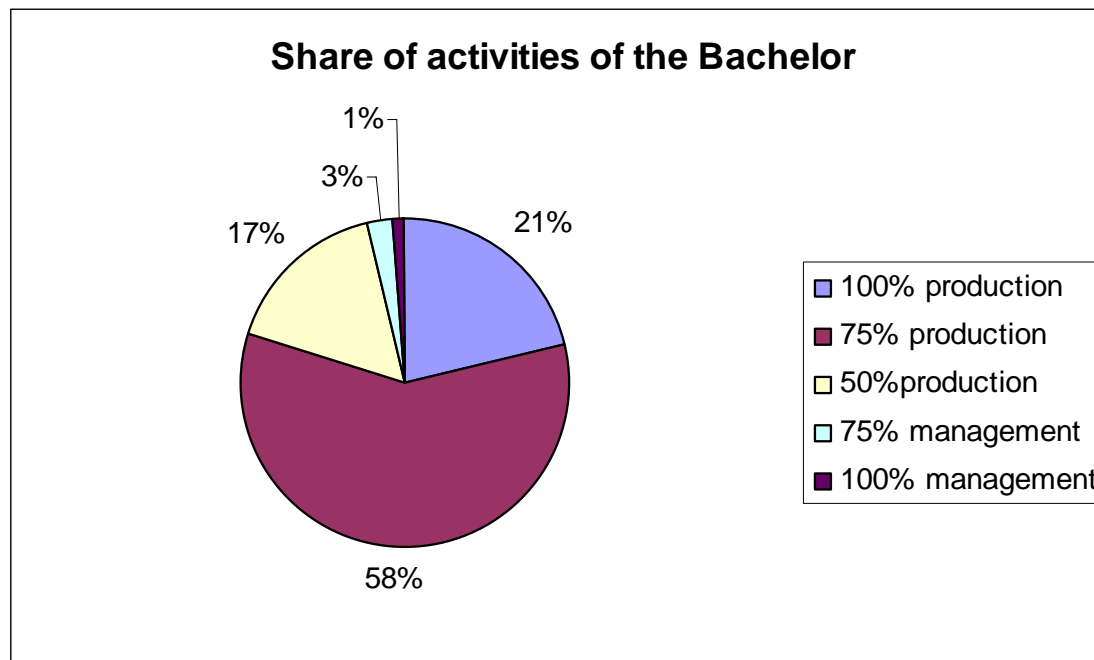


## Analysis of questionnaires / educational level of employees

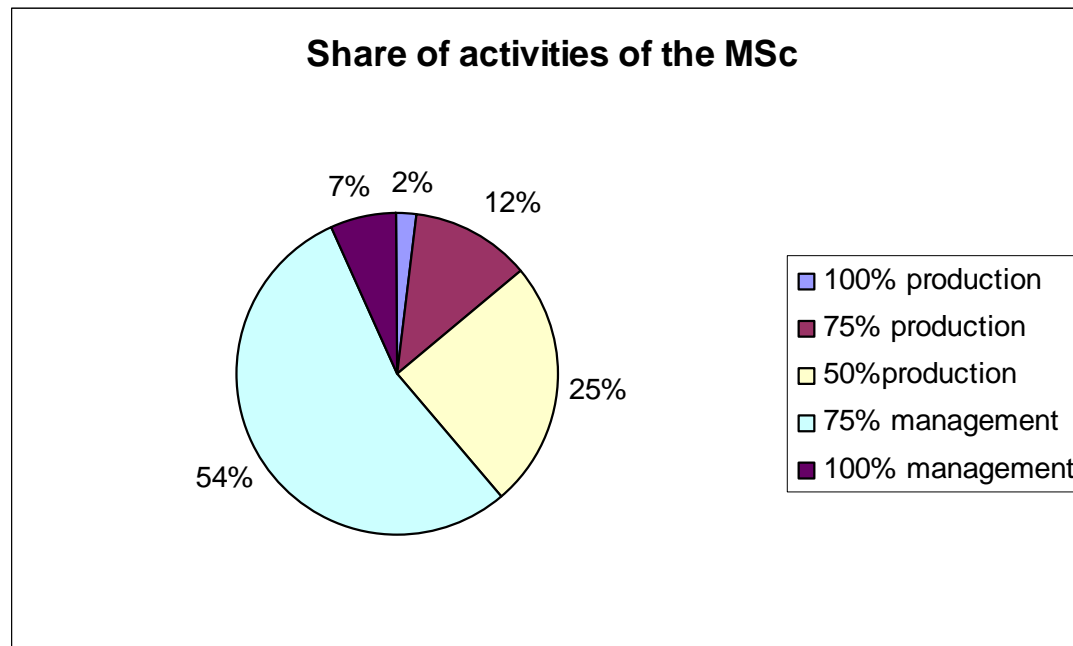
**No. of graduates is almost as high as number of non graduates, in smaller companies graduates are also active in the production**



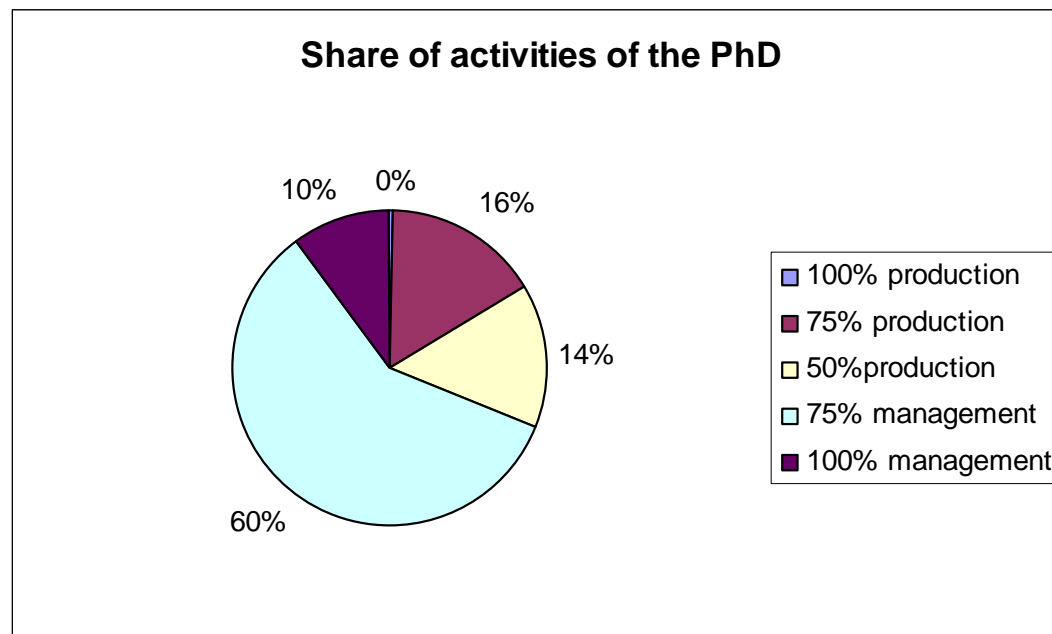
## Analysis of questionnaires / shares of activities of BSc



## Analysis of questionnaires / shares of activities of MSc

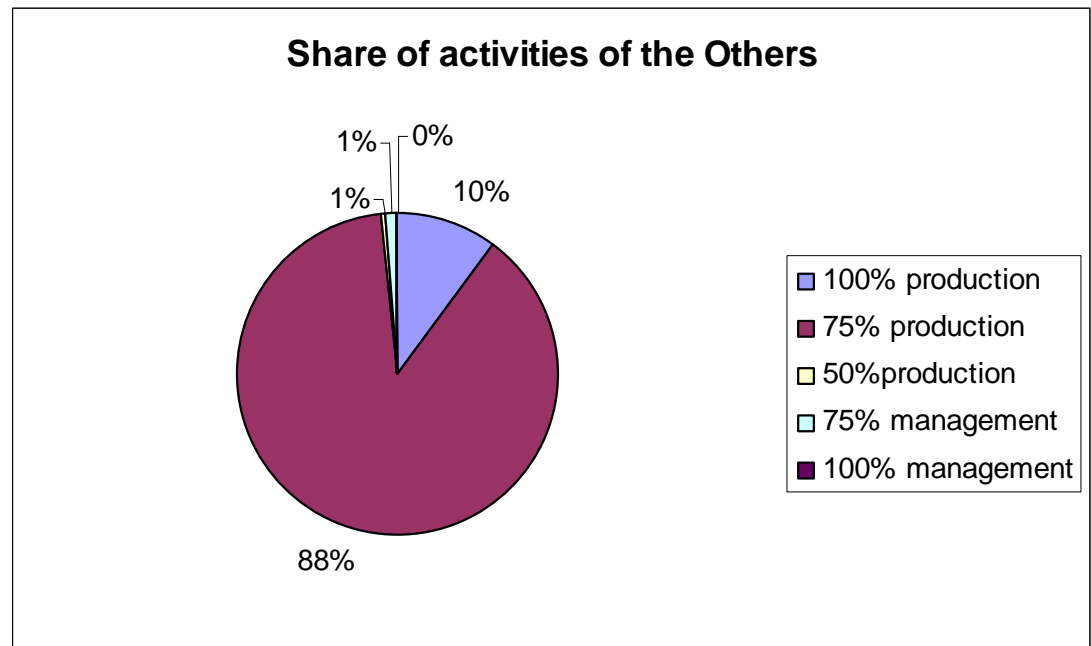


## Outcomes 1: Analysis of questionnaires/shares of activities



## Outcomes 1: Analysis of questionnaires/shares of activities

**Field of activity depends on the education and on the size of the company !**





## Analysis of questionnaires: skills of GECS staff now & in the future

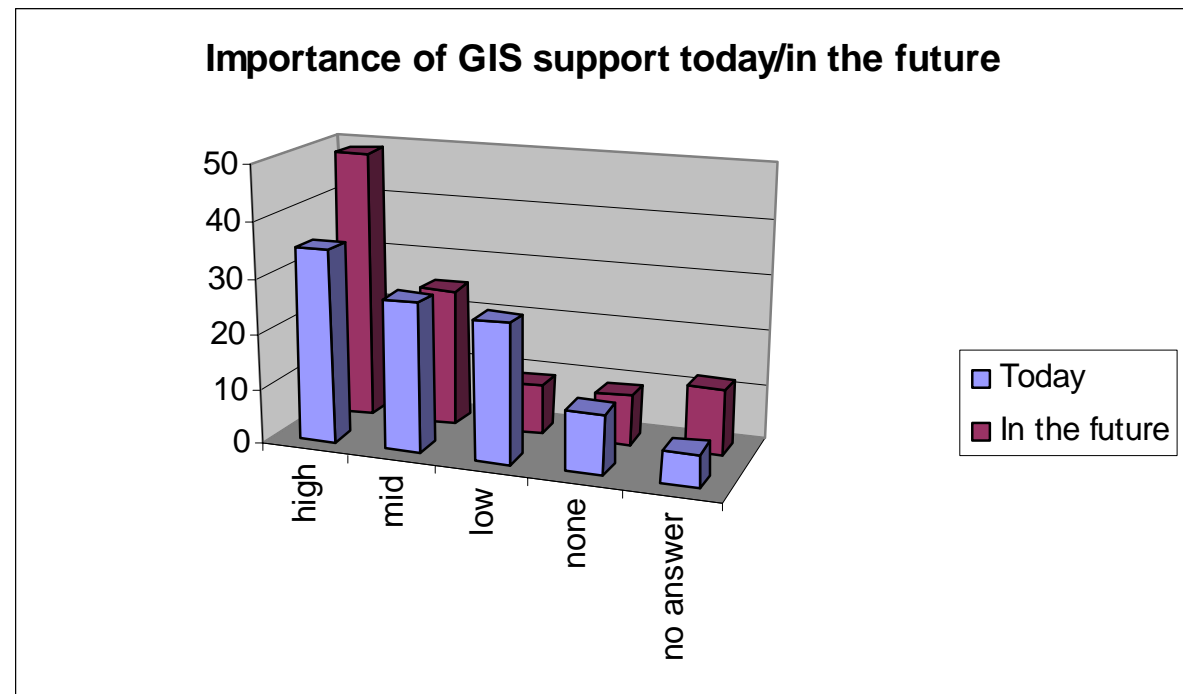
The importance of the following fields (now and in the future) have been examined:

- Geodesy, land surveying, mining/engineering surveying, photogrammetry, laser scanning, GIS development, GIS support, Digital Terrain Modelling, cartography, law, planning, urban development, rural development, valuation, finance and taxation, building economics, marketing, land and farm management, building design, construction technology, building quantities, cost control, basic competences (i.e. mathematics) and soft skills (i.e. presentation skills)

## Analysis of questionnaires: skills of GECS staff now & in the future

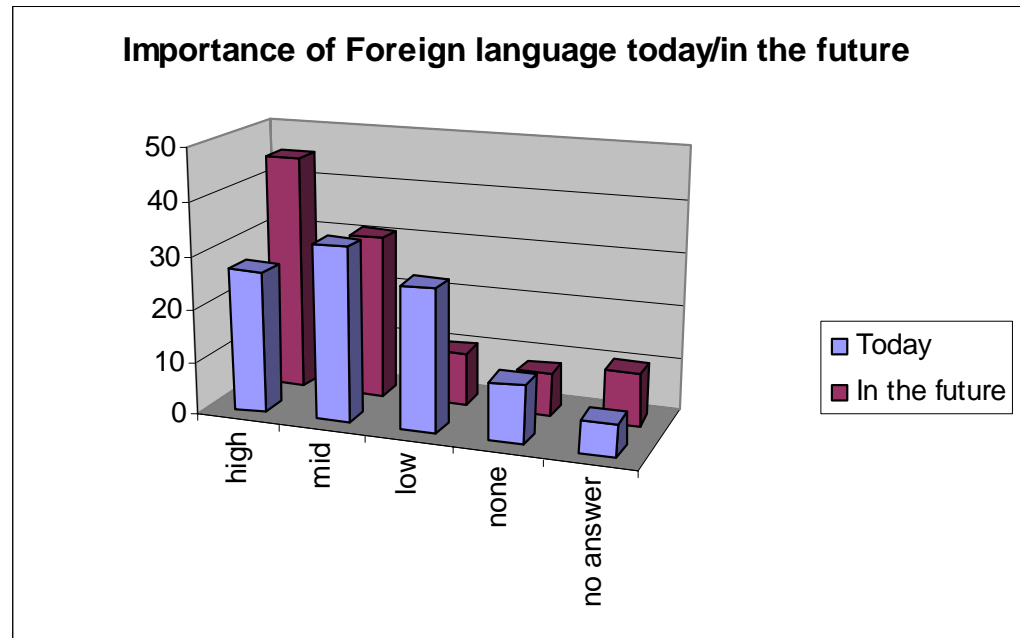
The presentation of all results would be too time consuming; → only a few examples

Estimation of importance of GIS support for today and for the future



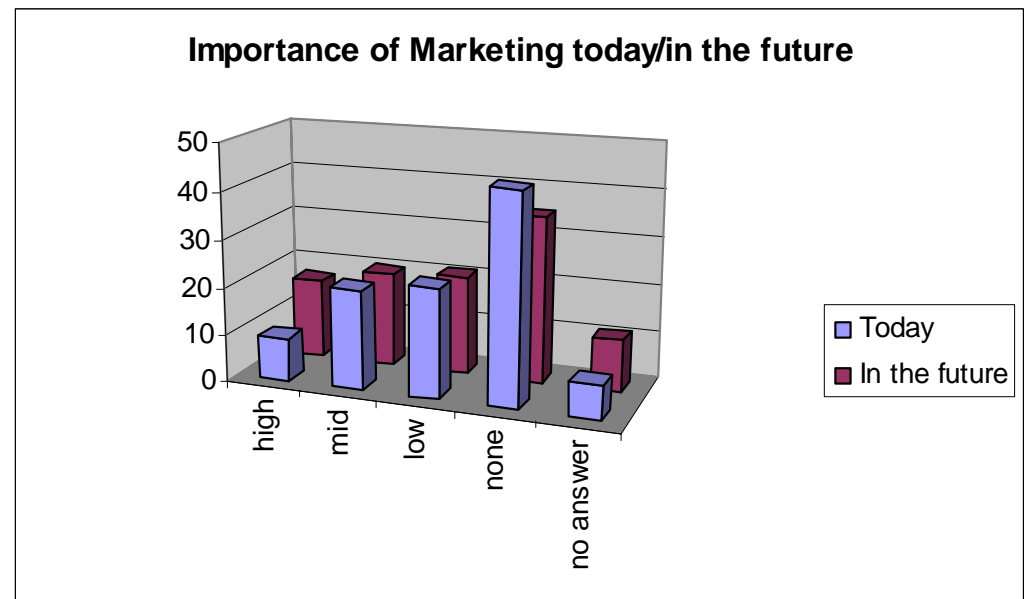
## Analysis of questionnaires: skills of GECS staff now & in the future

- Knowledge of foreign language is getting more important in the future

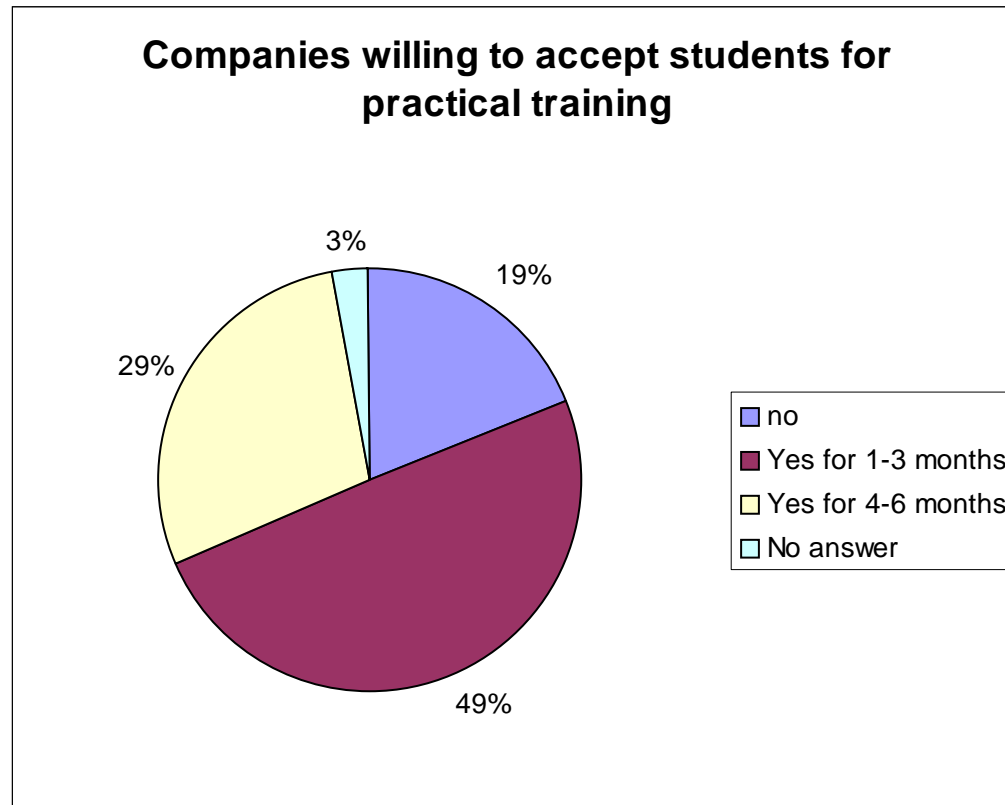


## Analysis of questionnaires: skills of GECS staff now & in the future

- ...also Marketing is getting more important !



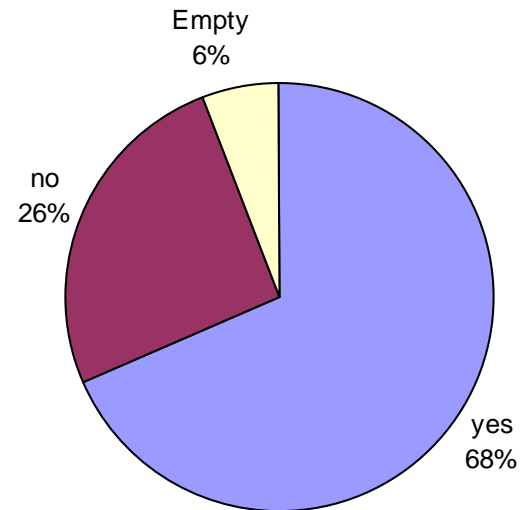
## Analysis: Mobility across Europe



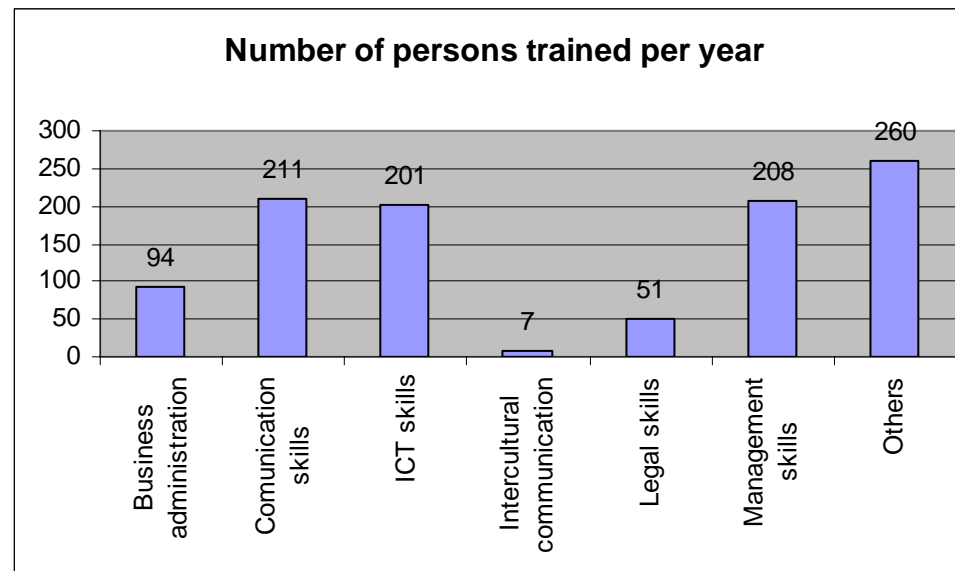
## Analysis: Continuous lifelong learning

- Does your company offer CLL to your GECS employees?

Continuous Lifelong Learning (overall)

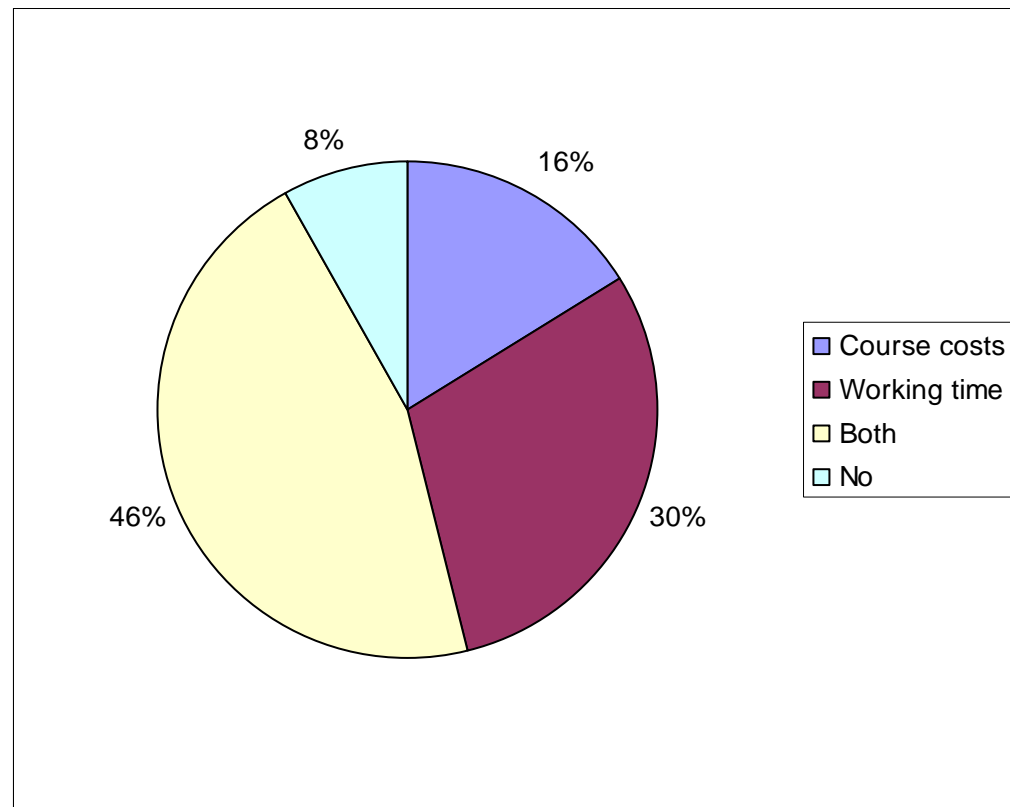


## Analysis: CLL/number of persons trained per year



## Analysis: support for CLLL activities by the enterprises

- Support of CLLL activities of GECS employees by their company





## Analysis: CLL/e-learning vs. face-to-face



## Part 2: Comparing the prerequisites to work as a chartered engineer

Main objective:

Providing an overview on the prerequisites  
to work as a chartered engineer  
within the European countries

## Comparing the prerequisites to work as a chartered engineer (2)

Participating countries:

Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Norway, Poland, Spain, Slovenia, Slovak Republic, United Kingdom



## Comparing the prerequisites to work as a chartered engineer (2)

### Outcome:

- Basic overview on legal prerequisites in the participating countries
- Links to chambers and interest groups

The oath has to be sworn in a court, could be in each own country. ¶  
 On the official documents, one has to sign and add the name of the court. x

<b>Czech Republic</b> x	University or Polytechnical Highschool in the subjects of Geodesy or Cartography x	10 semesters ¶ (6 semesters B.Sc. + 4 semesters Eng. Degree) x	Licence and interests. ¶ Czech office of surveying and cadastre in Prague: "Český úřad zeměměřický a katastrální" ¶ www.cuzk.cz ¶ x	After the study (5 years) 5 years of practice + state exam are required x	The situation will change after the Slovak Republic has joined the E.U. x
<b>Denmark</b> x	Master degree with specialization in: Land Management (Cadastral Science); Spatial Information Management (GIS-Science); Measurement Science (Danish name: Landinspektér) x	10 semesters: semester 1-6: basics in surveying, cadastral science, land regulations and planning ¶ semester 7-8: specialisation (see question 1) ¶ x	Licence ¶ The National Survey and Cadastre licence - provider for private practising surveyors ¶ ¶ Interests: ¶ The National Association of Surveyors (Den danske Landinspektérforening) x	3 years of practise as assistant surveyor. Recommendation from a senior surveyor (= the chief). No special exam is required. ¶ Only 5 - 10 % of surveying candidates end up as practising surveyors x	Foreigners can work in mapping companies etc. Only Danish citizens can get a licence as a practising surveyor (= monopoly on cadastral work) x
<b>Finland</b> x	Diploma Engineer in surveying x	10 semesters x	No professional body. The interest group is the ML (Union of Surveying Engineers) x	No separate licence or exam is required x	Have a recognised equivalent academic degree x
<b>France</b> x	Engineer degree from ESTP (Paris) ESGT (Le Mans) INSA (Strasbourg) option Long life learning after a significant professional experience. They have to pass the DPLG degree (Diplôme par le gouvernement) x	6 semesters after 4 semesters of preparation to a selective exam x	Licence ¶ The Ordre des Géomètres Experts (OGE) is the official body for accreditation of chartered surveyor ¶ www.geometre-expert.fr ¶ x	For engineers: 2 years of training session after the 5 years degree. ¶ For long life learning the training period is depend professional experience (minimum 7 years) ¶ x	The European inhabitants have to prove their academic study (title and university) in their country with a significant professional experience. A commission named by the Government study case by case the request. x
<b>Germany</b> x	Study of Geodesy or Geoinformatics x	9 semesters (university) or 8 semesters (university of applied science) x	Licence: OPA (Oberprüfungsamt in Frankfurt/Main) ¶ Interest Groups: AdvY ¶ www.adv-online.de ¶ or: BDV: = Bund deutscher Vermessungsingeniere ¶ www.bdvi.de ¶ x	State exam after 2 years practice and than another year of practice x	To work at a state office: ¶ → 2 years "Referendariat" ¶ To work in the private sector: ¶ → no requirements x
<b>Greece</b> x	Rural and surveying engineer x	10 semesters (=5 years) x	Technical Chamber of Engineers (all Engineering branches) x	Formally it is received with the diploma. The technical chamber provides a short examination on the	To work at a state office: ¶ Notrification of the academic title and membership at the tech-

## Dissemination of results

- Results are available to:
  - ...other working groups within the project
  - ...associations and chambers
  - ...participating companies and institutions