

**Economic Solutions  
to Changing Professional Training  
Requirements in Geodesy and Surveying**

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 TS 84.1 (0562) e-Learning

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**Overview**

German State of Lower Saxony  
 - 47.620 km<sup>2</sup> (2nd)  
 - 8 Mill. inhabitants (4th)

Surveying and Cadastral Authority:  
 - 2500 employees  
 - Age, qualification  
 - Budget for further training

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**Demand for Continuing Professional Development**

Increasingly rapid developments in geodetic methodology and technology

- State survey
- Cadastral survey
- GIS data capture
- Construction works
- Emerging applications

**Potential Topics:**

- geodetic reference frames
- transformations
- GNSS, esp. GALILEO
- satellite positioning
- physical heights and geoid
- mobile communication
- internet technologies

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**Special Case of Geodesy and Surveying**

- In the field of Geo Information Systems (GIS) several continuous training programmes are available, e.g. UNIGIS
- For geodesy and surveying no regular CPD programmes available :
  - high intellectual and financial investments for the instructor
  - mathematics & physics more difficult to impart
  - very small market, limited demand
  - restrictions by surveying authorities.

➤ Few specialised Master-courses (without distance learning concept)

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**Uncertainty of Professional Training**

- Cost-intensive
  - Fees, travel expenses
  - Loss of working hours
- Qualification of instructors
- Quality of instructions

- Reduced budgets for training programmes
- Growing age of personnel in surveying agencies
- Organisational reforms

➤ Effective outcome for employee and employer?

- references
- measures
- certification

➤ Controlling methods applied to selection, implementation, and evaluation of educational programmes

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### Provider of Professional Training

Further education provided by

- Senior staff members
- External coaches /experts
- Professional organisations e.g. FIG/DVW (seminars, workshops, congress)
- Commercial organisations, e.g. ION GNSS / NAVTECH Seminars

➤ Universities ???  
– Virtual academy

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### Quaternary Education Phase

- a life long learning scheme requires
  - an institutionalised place (University, Congress series, ...)
  - an universally accepted certificate (BSc, MSc, ...?)

Proposal:

- Universities as central carrier of CPD (contents)
- Governing board: professional organisations (e.g. FIG/DVW), surveying authorities, ...
  - Curriculum definition and contents
  - Programme evaluation
  - collecting funds
- Didactically trained instructors specialised to adult education
- Central bureau
  - enrolment
  - development CBT technology

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### e-Learning

- computer based training (CBT) technology is already developed
- Best practice examples for distance learning concepts are available
- Didactics for adult education is available, but rarely known to geodesists world / engineering instructors => specialised instructors necessary
- Required is an economical solution to such a CPD scheme
  - Key: multiple use of contents
  - Customer Relationship Management (CRM)

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### Conclusions

- Rapidly changing knowledge
- CPD programme for geodesy needed
- Economic solutions difficult to achieve
  - Deployment of CBT
  - multiple use of contents (relate 3<sup>rd</sup> / 4<sup>th</sup> education phase)
  - Programmes carried by universities, active involvement of professional organisations
- Research funds available, e.g. EU Life Long Learning or Knowledge Society programmes?

*Shaping the Change*

Suggestions and comments highly appreciated  
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