



## Teaching the management of earthquake risk reduction through research

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This paper presents the teaching experience on earthquake risk management the author acquired while at Institute for Technology and Management in Construction (formerly Institute of Construction Machinery) at the Universität Karlsruhe (TH), Germany. The Institute was involved, while the author was there, in two research initiatives focusing on natural hazards:

- the Collaborative Research Centre 461 "Strong earthquakes: from geosciences to civil engineering", funded over 12 years 1995-2007.
- the Research Training Network 450 "Natural disasters", funded over 9 years 1998-2007.

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While in the first case the involvement of the author was limited, as she was herself postgraduate research assistant (so employed as a student), within the Research Training Network she was able to supervise the individual study and the diploma works of students.

Within the Collaborative Research Centre, more precisely subproject "Modelling and simulation" the author was involved in a building survey at urban scale of 1500 buildings in Bucharest, Romania. Prior to the survey she developed a questionnaire to be filled on site and after the survey she wrote a report on how the data from the survey shall be transferred into an ArcView database (2000-2001). This report contributed to training of a diploma work within the institute, a diploma work for a Civil Engineering degree, specialisation construction management. The knowledge and experience of the author on the built substance in Bucharest, her home city, was of use for these activities, although she is a graduate of architecture from the Universität Karlsruhe (TH).

As a fellow within the Research Training Network 450 "Natural Disasters" the author supervised one individual study and two diploma works within her own topic of research, "Applicability and economic efficiency of seismic retrofit measures on existing buildings". Building economics belongs to the curriculum of architecture graduates at the Universität Karlsruhe (TH).

The individual study was on "Costs calculation in the seismic retrofit of existing buildings" (2001), considering strengthening measures with reinforced concrete and steel, a seismic zone. The diploma works were on

- "Building survey system for the representation of the load bearing structure" (2001), and it should lead further the research formerly performed within the Collaborative Research Centre, by permitting to perform also a quantitative, not just qualitative survey, supported also by an autoCAD script;
- "Construction management at the strengthening measures for seismic retrofit" (2003), where this time innovative measures, like glass fibre polymers and carbon fibre polymers were considered.

All works lead to a Civil Engineering degree, specialisation construction management.

The paper will present how the involvement of student into larger research projects presents new challenges in their training and how this contributes to "learning through teaching" for the authors at postgraduate level as well. Presently the author is a fellow with a reintegration grant at the ERGOROM '99 foundation and researcher at the Conservation and Restoration Chair of the "Ion Mincu" University of Architecture and Urban Planning, both in Bucharest, Romania. At the "Ion Mincu" University of Architecture and Urban Planning natural disaster connected topics are taught at the Urban Planning department and at the Technical Sciences chair, as they are mainly connected to urban interventions in emergency situations or to structural aspects. It is a challenge how in teaching of interventions or simply surveys of historic monuments this could be involved. Since the 1970s there isn't anymore such a separation between urban planning and individual architecture object in conservation issues, as the so-called "integrated conservation" is promoted.