

Lifelong learning – a necessity in domain of hydrotechnics

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Abstract: Lifelong learning is the ongoing, voluntary, and self-motivated pursuit of knowledge for either personal or professional reason. It enhances social inclusion, active citizenship, and personal development, self-sustainability, rather than competitiveness and employability. In domain of hydrotechnical engineering, lifelong learning means the periodic trainings of specialists to be able to use advanced hydroinformatic tools in the design, exploitation and optimization of various hydrotechnical and environment protection arrangements, preparation of flood risk maps, in accordance with the requirements of Water Framework Directive 2000/60/EC and Flood Directive 2007/60/EC of European Commission. This paper describes the LdV-ToI project: "Development of knowledge centers for lifelong learning by involving of specialists and decision makers in flood risk management using advanced hydroinformatic tools" developed by Department of Hydrotechnical Engineering, Faculty of Civil Engineering, Politehnica University Timisoara.

Keywords: lifelong learning, transfer of innovation, hydroinformatic tools, modelling.

1. INTRODUCTION

Lifelong learning may be defined as learning that is pursued throughout life: learning that is flexible, diverse and available at different times and in different places. Lifelong learning crosses sectors, promoting learning beyond traditional schooling and throughout adult life.

The European Commission found that lifelong learning has "Four broad and mutually supporting objectives: personal fulfilment, active citizenship, social inclusion and employability/adaptability". In this regard, lifelong learning has lifewide dimensions that transcend narrow economic and vocational aspects. The European Lifelong Learning Initiative defines lifelong learning as "a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes and to apply them with confidence, creativity and enjoyment, in all roles circumstances, and environments." [1]

The Lifelong Learning Programme (LLP) of European Commission was designed to enable people, at any stage of their life, to take part in stimulating learning experiences, as well as developing education and training across Europe. With a budget of nearly €7 billion, the programme, which ran from 2007-

2013, funded a range of exchanges, study visits, and networking activities.

The Leonardo da Vinci sub-programme funded practical projects in the field of vocational education and training. Initiatives ranged from those providing work-related training to individuals, to larger cooperation efforts. [2]

In domain of hydrotechnical engineering, lifelong learning means the periodic trainings of specialists to be able to use advanced hydroinformatic tools in the design, exploitation and optimization of various hydrotechnical and environment protection arrangements, preparation of flood risk maps, in accordance with the requirements of Water Framework Directive 2000/60/EC (WFD) and Flood Directive 2007/60/EC (FD) of European Commission.

The one of WFD purposes is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which contributes to mitigating the effects of floods, droughts and pollution.

The aim of FD is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

The Directive shall be carried out in coordination with the WFD, notably by flood risk management

plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans. All assessments, maps and plans prepared shall be made available to the public. [3]

2. THE NECESSITY OF LdV-ToI PROJECT

Meanwhile in the recent past serious flood events occurred in Europe, EU member countries have been working on the implementation of the Water Framework Directive & Flood Directive. Huge infrastructural investments are and will be running. There is a need for i) proper understanding of river system and landscape behavior, possible prevention and measures, how to deal with potential damages and losses; ii) having engineers skilled in the field related to development of water management infrastructure as well as in system operation, who are familiar also with the newest technological achievements, capable

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to develop area-adjusted solutions by understanding the national/country specific environmental processes. An extensive programme of Water Authority of Romania has been running in Romania and in each EU country to provide flood risk maps in all the main river basins across the entire country. Flood risk management plan (must be finalized by end of 2015) is a communicator and disseminator tool of the knowledge gained during two previous stages across the horizontal structures of governmental and non-governmental bodies dealing with flood protection, flood mitigation and flood struggle in general. Flood risk management plans, considered as a communicator and disseminator tool across the horizontal structures of governmental and non-governmental bodies dealing with flood protection, flood mitigation and flood struggle in general. They mainly include proposals on how to reduce the losses of lives, property and environmental through flood prevention, protection of vulnerable areas and increased flood preparedness in each river basin. The way of processing of this flood risk management plans on IT platforms changes the information stream flow. Future development plans of regions and cities will get a proper guidance and platforms for future feasibility studies. In Romania, each state institution wants to improve the skills of their employees. There is a lack of specialists who has enough knowledge about the hydroinformatics, thus in everyday work there is a very limited use of such tool, meanwhile the work with complex problems has generated recently a need to use valuable tool and proper training series and consultation center. [4]

3. DESCRIPTION OF PROJECT

Project title: **Development of knowledge centers for life-long learning by involving of specialists and decision makers in flood risk management using advanced Hydroinformatic tools**

Project acronym: **KnoCH**

Project type: **Leonardo da Vinci, Transfer of Innovation**

Project duration: **24 months (01.01.2012 – 31.12.2013)**

Project value: **330.771,00 EUR (EU Grant 248.064,00 EUR)**

Partners:



POLITEHNICA
University Timisoara,
Romania

Partner P0 – lead partner: POLITEHNICA University Timisoara (UPT), Faculty of Civil Engineering, Department of Hydrotechnical Engineering, Romania - was a consortium leader, responsible for smooth project management, coordinates partners' activities, provides the necessary basic human and IT infrastructure of the training center in Timisoara. Its dedicated staff attended the training course-series in Budapest, Timisoara and in

Prague to be able to hand over the gained knowledge in Romanian language to local project target group. P0 developed course material in Romanian language contains the elaborated national survey results (assessment of the up-today needs). The department was responsible for creation of project website which serves as multi-lingual information communication channel (project news in Romanian language continuously); for national level training execution, development and printing course materials for attendees, dissemination of project results in national and international level and to reach national recognition of training courses and to ensure elaboration of project results into post-graduate course.



DHI. as, Prague,
Czech Republic

Partner P1 – core partner: DHI. as, Czech Republic - responsible partner to hand over the technology by training of the future trainers of P0, P2, P3 and P4 partners, providing MIKE 11 software, training materials developed for the training of trainers, handing over its teaching methodology as well as guarantee the qualified trainers for each training event. Beside these in the 2nd phase of the project, DHI organized and hosted an event in the Czech Republic (study tour) to show realized examples of the applied hydroinformatics in the Czech Republic.



Budapest University of
Technology and
Economics, Hungary

Partner P2 – core partner: Budapest University of Technology and Economics (BME), Department of Hydraulics and Water Resources Engineering, Hungary. Role of BME in project: participation in project committee meetings; delegating staff to the trainings of trainers: some of its staff members was the trainers who give training courses, besides Budapest in some centres of Hungarian regions; provide lecture room for in site courses and sufficient equipment (computers) for the development of the Hungarian modeling center in Budapest; localization and testing the knowledge and skills; responsible for training of Hungarian professionalists; development of educational materials adapted to Hungarian conditions in Hungarian language; organization of events and getting involvement of relevant sectors; dissemination and communication of project results; contribution to the project website news, to provide sufficient information in Hungarian language; tasks related to recognition of trained person's skills and knowledge gained from trainings.



Middle-Danube-valley
Water Management
Directorate, Hungary

Partner P3 – core partner: Middle-Danube-valley Water Management Directorate, Hungary - participates in project committee meetings and smooth project management in partner level. Delegating staff to the trainings, acting as test vocational partner, share experiences in applied water management and assist to hand over training results in most effective way to the targeted sector. Developed a study about needs of practicing water sector, contribution to the Hungarian adapted educational materials, organization of events and getting involvement of the relevant sectors in Hungary and dissemination of the project results.



National Institute for
Environment, Middle-
Danube-valley Branch,
Hungary

Partner P4 – core partner: National Institute for Environment, Middle-Danube-valley Branch, Hungary - participates in project committee meetings and smooth project management in partner level. Delegating staff to the trainings, acting as test vocational partner, share experiences in applied water management and assist to hand over training results in most effective way to the targeted sector. Developed a study about needs of practicing water sector, contribution to the Hungarian adapted educational materials, organization of events and getting involvement of the relevant sectors in Hungary and dissemination of the project results.

Aims and objectives of project:

1. To provide newest technical solutions and updated knowledge for the intensified water sector development via transfer of good `living` technology which is already running in different part of the world and was not accessible for the aimed target group due to language barriers and financial capacities. It will be solved by the training activities of skillful trained national trainers;
2. To establish sustainable, reachable `seats` of vocational life-long learning center for flood management where adjusted trainings will be available for professionalist in all age. National trainings will be ensured by the trained trainers using not only technology but techniques learnt in the first year of project execution;

3. To introduce a communication tool for target groups and to integrate their needs into training programme by the help of surveys;
4. To improve knowledge for technical solution assessment methods in integrated water/flood management thus to create basis for quality standard measures, improvements;
5. To provide not only theory of hydro-informatics but its application evidences as well: experience of the real application of the presented IT technology (`I can believe if I can see` principle) and start real on-site discussion by participation of representative of different sectors;
6. Rise better availability to the European labour market, to contribute to the personal carrier of practicing engineers;
7. Set up a regional `Excellent Network` for applied hydro-informatics for life-long learning, where high quality co-operation between institutions and enterprises providing learning opportunities was established.

Contribution to national priorities:

1. Development centers of excellence in VET (there is a need to develop quality referential domain and their certification to European standards).
2. Promoting FP (professional training) in the life sciences (there is a need to balance technical development / performance profile on the European market / Romanian / Hungarian with FP in the field).
3. Exchange of best practice in the recognition and validation of learning results in informal / non-formal contexts.
4. Institutions / organizations in geographic areas with poor participation in the program LdV / ToI.

Type of Transfer of Innovation:

The transfer aimed within this project is to make the DHI developed technology and know-how related to flood management to wider field of beneficiaries accessible. Basically, the main targeted group of beneficiaries of this project is the practicing engineers. The expected result and wider transfer of this ITC technology (to communicate the possible use of the IT technology results) can help having better communication and understanding of water related measures between water and other sectors such as nature protection, urban, spatial and regional planning.

The project based on existing projects and DHI own developments. DHI has developed not only an already word-wide proved technology but a series of training programmes which are adjustable to the trainees` actual professional level, skills and focus. Transfer of this innovation to Romania and Hungary was ensured by well-planned work of the professional project staff. Project partners (P0, P2), who are core bodies in RO and HU for localization are centers of excellence in water management and in lifelong learning education but any of them has used that specified technology which DHI was provide within this project. Their best skilled staff was trained via DHI ensured high level training courses. These trained local Romanian and Hungarian trainers was, then, transfer the gained knowledge in a frame of

`roadshow` and doing trainings in Timisoara and Budapest centers. The advantage of the selected way of this 2-nd level of transfer is that due to portable software keys the idea of `moving lecture room` can be easily realized with laptops: thus the geographical transfer, the delivery of knowledge and technology to the spots. Localization and adaptation was executed by not only the translation of original DHI materials to national languages, but based on these materials national educational materials was developed in Romanian and Hungarian languages, which will be used also in post-graduate courses at P0 and P2. Partners 3 and 4 was responsible for the realization of real applied mean of transfer, getting up-today feedback from applied hydro-informatics perspective / the same was applied in Romania via P0 partner who involved state administration staff/. The methodology of transfer builds on the interactive approach: the so called on-job training, the exercise based module follows the delivered lectures. [4]

4. RESULTS

- Trained national trainers (Romanian, Hungarian), realized: beginning 2013 – over 15 national trainers
- National training centers in Romania and Hungary, realized in first half of 2012
- Developed national training materials, realized beginning 2013
- National events – national seminars on local languages in Romanian and Hungary, realized late 2013
- Local (national level) Certificates on trainings, realized early 2013
- Field trip to the Czech Republic, realized in august 2013
- PhD students training for developing their theses in domain of water resources management
- Masters courses dissertation preparation using modelling with MIKE11
- Introduction in master courses curricula modelling course using advanced hydroinformatic tools.

Public project activities:

- Local trainings in Hungary: 19 September 2013 Győr, 25 September 2013 Debrecen, 26 September 2013 Budapest, 27 September 2013. Pécs - *Numerical basis of modelling and practical applicability* - 128 participants
- Local trainings in Romania: 18-20 April 2013, 23-25 May 2013, 11-13 July 2013, Timisoara – *Hydrodynamic modelling using advanced hydroinformatic tools* – 57 participants
- Informations for the participants of the national level courses (the national level certificates)
- National and international level dissemination (conferences and publications): Bari and Venice, Italy; Albena, Bulgaria; Budapest, Hungary; Antalya, Turkey; Giessen, Germany; Timisoara, Cluj, and Bucuresti, Romania
- Closure conference - 3 December 2013, Timisoara, Romania.

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