

# Stimulating Personal Development and Knowledge Sharing (editorial special issue)

Citation for published version (APA):

Koper, R., Stefanov, K., & Dicheva, D. (2010). Stimulating Personal Development and Knowledge Sharing (editorial special issue). *International Journal of Continuing Engineering Education and Life-Long Learning*, 19(4/5/6), 271-275.  
<https://www.inderscience.com/info/inarticletoc.php?jcode=ijceell&year=2009&vol=19&issue=4/5/6>

## Document status and date:

Published: 21/01/2010

## Document Version:

Peer reviewed version

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## Editorial

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**Biographical notes:** Rob Koper holds a PhD in Educational Technology from the OUNL. Since 1998 he has been a Full Professor in Educational Technology, specifically in e-learning technologies. He was responsible for the development of educational modelling language (the predecessor of IMS learning design). As the Director of RTD in learning technologies, he led the OUNL's contribution to the IMS-LD specification activities. His research focuses on self-organised distributed learning networks for lifelong learning, including RTD into software agents, educational semantic web, interoperability specifications and standards.

Krassen Stefanov is an Associate Professor at the Faculty of Mathematics and Informatics and Director of the University Computer Center at Sofia University 'St. Kliment Ohridski'. He has a strong background in technology enhanced learning, teacher training, open platforms for software and services and semantics-based knowledge systems. He has a strong record in participating in RTD projects. He has more than 50 publications and was involved in the program committee of many international conferences. He is a National Expert for the Bulgarian Ministry of Education and Sciences in the areas of ICT training, teacher training, national programs and curricula.

Darina Dicheva is Paul Fulton Distinguished Professor of Computer Science at Winston-Salem State University, USA. She has a PhD in Computer Science from Sofia University, Bulgaria. Her research interests include digital libraries, intelligent learning environments, semantic web, social computing and adaptive information retrieval and filtering. She has authored over 110 research papers and textbooks, and has been on the program committees of more than 40

international conferences and workshops in the recent years. She has been PI and Co-PI of a number of projects funded by US NSF and European Union research programs.

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## **1 Introduction**

This special issue contains articles based on selected papers presented at the First TENCompetence Workshop ‘Stimulating personal development and knowledge sharing’, which took place in Sofia, Bulgaria on 30–31 October 2008. TENCompetence is a large integrated RTD project funded by the European Commission under the IST/TEL027087, program.

## **2 The TENCompetence project**

The EU 6th Framework Integrated Project TENCompetence ([www.tencompetence.org](http://www.tencompetence.org)) aims at developing European open-source infrastructure that will support individuals, teams and organisations in lifelong development of competences. The infrastructure will enable:

- 1 creating formal and informal learning networks in different professions and domains of knowledge
- 2 assessing and managing the competences that are acquired at any stage in life by the participants of a learning network, taking into account that people who have learned from many different formal and informal learning sources
- 3 stimulating the reflection on the current competences to support the formulation of new learning goals
- 4 searching for adequate formal and informal learning resources to build new competences or to update existing competences in a profession or domain of knowledge
- 5 providing the actual learning environment that is needed to perform learning activities
- 6 providing effective and efficient support to learners
- 7 support for sharing learning resources.

To this end, TENCompetence is conducting RTD activities to develop and integrate models and tools in four specific areas for the creation, storage and exchange of:

- knowledge resources
- learning activities and units of learning
- competence development programmes
- networks for lifelong competence development.

The project consortium, which consists of 13 partners from nine countries, conducts various large scale pilots. All these projects contribute to the common goal of developing an open source infrastructure that contains all the services needed to support individuals, teams and organisations to develop their competences. This includes open, usable and accessible services for:

- creation, sharing, discovery and use of knowledge resources, learning activities and learning paths by individuals, teams or organisations
- development, use, monitoring and maintenance of competence frameworks for different professions or domains of knowledge
- assessment of competences
- registration, use and sharing of personal data (profiles, portfolios and certificates)
- discovery of suitable learning resources adapted to the user's needs and profile
- support of users to efficiently navigate through relevant learning resources to build specific competences
- support for users to learn in new fields and for the people providing the support (e.g., by providing monitoring services, e-mail handling, etc.).

The project will disseminate its products widely and for free, will develop new business models for companies active in publishing, training provision, education, human resources management (HRM) and technology support and will train associated partners, and especially SMEs, to deliver these services. The TENCompetence infrastructure is aimed to provide a significant push towards further integration and collaboration in support of the European knowledge society. It can be used at all levels of learning: primary, secondary and tertiary education, continuing education, adult and company training and all forms of informal learning.

### 3 Contributions

The papers included in this special issue present the state-of-the-art in the area of lifelong competence development, including the latest results of the current research under the TENCompetence project.

The first three papers are related to *LearnWeb2.0*, a set of tools and services aimed to integrate models and tools for the creation, storage and exchange of knowledge resources, so as to make Web 2.0 information accessible in ways that better support lifelong learning and competence development.

In their paper 'Social Sharing in LearnWeb2.0' Marenzi, Zerr, Abel and NejdI present the main functionalities of *LearnWeb2.0 Version V.2* for supporting lifelong competence development of individuals. Based on a real life scenario, the authors illustrate the ways in which people interact in their working environment to create, search and share knowledge resources and to develop skills that help them improve their work experience, which in turn are used to identify software functions that support such interaction. The focus is on novel features that automate time-consuming user actions to increase the usability of *LearnWeb2.0*.

In the contribution of Pérez-Sanagustín, Santos, Moghnieh, Hernández-Leo and Blat, the authors propose a context-based methodology for designing learning environments. They relate the functional requirements of the learning environments with an abstract set of Web 2.0 services. They focus on the design of a knowledge resource sharing management (KRSM) system and discuss the components of this methodology and its application. The proposed methodology has been used for rapid conceptualisation and integration of *LearnWeb2.0*; the latter has been modelled in accordance with the set of generic activities inherent to its functional requirements and the supported types of knowledge resources. Activity contexts have been identified and used in defining system components that can be mapped onto existing Web 2.0 services.

The third paper related to *LearnWeb 2.0*, 'Building a knowledge repository for life-long competence development' by Grigorov, Georgiev, Petrov, Stefanov and Varbanov, is concerned with two essential parts of *LearnWeb2.0*, the knowledge repository and the knowledge resource sharing and management (KRSM) web services, which allow access to and management of the repository. The paper presents the *LearnWeb2.0* architecture and discusses the choice of Fedora as a basic platform for the digital repository, the modelling of digital objects and the metadata for resources, as well as the implemented web services for knowledge resource sharing and management.

A pilot implementation of the TENCompetence infrastructure is the topic discussed by Shoikova and Denishev in their paper. The authors present the development of the EPIQ's business demonstrator that is focused on implementing the TENCompetence infrastructure to support top and middle management, various professional communities and individuals for improving the processes of competence management, organisational learning and knowledge management in an enterprise context. The study aims to explore how the process of externalisation of tacit organisational knowledge in an online environment (such as the TENCompetence technological infrastructure) can be enhanced.

Another central theme in the special issue is related to learning networks, and specifically, to providing models and approaches for supporting users in their orientation in social networks. In their paper 'Web-service architecture for tools supporting lifelong e-learning platforms', Dimov and Stefanov present a software solution aimed to provide reusable tools that support the management and orientation of users within Learning Networks. They propose a reusable and extensible service-oriented architecture that supports the implementation of various tools for lifelong e-learning platforms, including the targeted tools.

In the same vein, the paper 'Social support system in learning network for lifelong learners: a conceptual framework' by Nadeem, Stoyanov and Koper presents a conceptual framework for designing a social support system (SoSuSy) for finding people in learning networks. The system is aimed to connect learners dealing with similar problems they encounter while learning and help them by increasing their social interaction and using their combined skills. The authors propose the use of users' profile in a social network and the public content they create supported by Web 2.0 applications (e.g., blogs and bookmarks) to search for people who can possibly help them with their problems.

The paper 'Learner reflexivity, technology and 'making our way in the world'' by Johnson and Sherlock is also related to social networks. It presents TrackMe – a tool for encouraging learner reflexivity about their online habits. The authors focus on the role of personal reflexivity in the acquisition and development of habits for online social engagement for increased social mobility and effective lifelong learning. They discuss

how understanding the outcomes from engaging with TrackMe shed light on the deeper mechanisms of personal change, technological engagement and increased social capital. The authors advocate that through using TrackMe as an exhortative tool something of the value of social networks could be articulated to learners and 'made real' which would otherwise be much more difficult and abstract.

In 'Improving the unreliability of competence information', Miao, Sloep, Hummel and Koper investigate information fusion technologies that may be applied to address the problem of unreliability of competence information. The authors analyse the similarity between a wireless sensor network and a learning network and conclude that information fusion shows promise as a candidate solution to the problem and can help for achieving an improved estimate of competences by fusing information coming from multiple sources and diverse types of sources.

The last paper, 'Effect of adaptive learning style scenarios on learning achievements' by Bozhilov, Stefanov and Stoyanov, compares three adaptive learning style scenarios, namely matching, compensating and monitoring. To measure the effectiveness of the different adaptive scenarios, the authors have developed a software application that provides support for automatic assignment of students to experimental groups based on their learning styles questionnaire results and run-time adaptation based on embedded adaptation control. The conducted experimental study showed that although there wasn't a significant difference, the monitoring adaptation led to slightly higher learning achievements compared to the matching and compensating adaptation.

### **Acknowledgements**

We would like to extend our sincere thanks to all the reviewers of this special issue, who contributed immensely to the final quality of the papers.