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Editorial

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Biographical notes: Dr. Chien-Sing Lee is a Senior Lecturer at the Faculty of Information Technology, Multimedia University and a Chairperson of the Centre of Excellence for e-Learning, Multimedia University, Selangor, Malaysia. She is the Chief Architect behind the vision and mission of the ASEAN Centre of Excellence for e-Learning and Cyberlaw, of which Multimedia University is the hub. Having served in government-to-government activities, e.g. the Japanese–Malaysian government tele-education satellite project and the UNESCO-related human resource development initiatives under the Malaysian Ministry of Information, she has embarked on reference modelling as a means to identify and synergise commonalities across physical and disciplinary boundaries. Her research interests are in instructional design, computer-supported collaborative learning, games-based learning, mobile learning, ontology and the semantic web, information systems development, human resource development, knowledge management, change management and quality assurance. She serves in the editorial board and programme committee of several international journals and conferences.

Professor Dr. Rob Koper is Professor and Director of Learning Technologies Research at the Open University of The Netherlands, where he leads a team of around 40 researchers. He has 22 years of experience in the field and has (had) numerous roles in management and advisory boards, like the National Assessment Agency, standardisation bodies like IMS, CEN/ISSS and advisor for the new European Commission's RTD programmes. He has published over 200 publications in scientific journals and books. He was responsible for the development of Educational Modelling Language, currently an open standard through the IMS consortium (IMS-LD) and he leads or participates in a variety of EU-funded R&D projects. He served in many editorial boards and programme committees, and was responsible for the organisation of a large number of international conferences, seminars and workshops in the field. His research focus is on self-organised distributed learning networks for lifelong learning, including the use of interoperability specifications and standards.

Professor Dr. Piet Kommers is an Associate Professor at Twente University in The Netherlands. His interest and prior research are teacher education, advanced learning technologies, conceptual design and visual communication. His dominant paradigm is that media provoke alternative new ways of living and stimulate youngsters to expose themselves in new literary and iconic genres. Due to his international coordinatorship in European programmes and conferences he received the title of UNESCO Honorary Professor and the title of Honorary Doctorship from Capital Normal University in Beijing. As Lector in Fontys University of Applied Science he stimulated ICT measures in teacher education; in particular the integration of mobile communication in learning scenarios. He is a frequent keynote Lecturer and active in the joint consortia for the EU 7th framework programme.

Professor Dr. John G. Hedberg is Millennium Professor of ICT and Education, and Head of the School of Education, Australian Centre for Educational Studies, Macquarie University, Sydney, Australia. He has worked on several research projects about the use of ICTs in learning. These include: the use of mobile phones as social software tools in orienteering tasks in geography, designing learning objects for small screen display, using cognitive tools to develop mathematics problem-solving repertoire; internet literacy and the production of multi-modal artefacts particularly in history and science.

With increasing collaborative initiatives across geographical boundaries, meaningful collaborative sharing revolves around mapping common goals and the potential for interoperability. Successful collaboration can result in innovative practices and higher quality learning and teaching.

This special issue is concerned with learning design as the primary foundation for service-oriented and content-oriented paradigms. The investigations are categorised around three themes:

1 framework, management, people-oriented or policy issues

2 technological issues

3 assessment issues.

The first theme has two sub-themes. The first sub-theme revolves around management guidelines for forming and sustaining successful communities of practice and/or a

thriving learning organisation. The second sub-theme is criteria for forming successful reference models. As for the technological issues sub-theme, we are interested in Information and Communication Technology (ICT) or Semantic Web technologies used to scaffold learning designs, and technological means to scaffold collaborative pedagogical practice designs. Assessment issues focus on pedagogical practices for forming best practices and assessment of reference models.

Our framework for investigation centres on the use of reference models to identify commonalities. We hope to synergise these commonalities for common benefit in terms of faster adoption, experimentation and adaptation of successful practices in local contexts.

Framework, management, people-oriented or policy issues

Secundo, Elia and Taurino present a case study of applying the Problem-Based Learning (PBL) approach in web-based environments. The application domain concerns business management and technology management topics within the e-Business Management Section (eBMS). It describes the rationale and the main features behind the PBL for creating business leaders in the emerging competitive environment. As conclusions, it is formulated that characteristics of the system supporting the PBL approach are as follows: tools for both synchronous and asynchronous events, curricula-driven and problem-driven (scenario-based learning) approaches, collaborative-based and self-pace-based learning experiences, tools for both virtual and face-to-face learning experiences, multi-source feeding (authoring tool, market, built-in ad-hoc from knowledge management resources) and the competence taxonomy built on ICT-driven business innovation leadership knowledge domain.

Vivitsou, Lambropoulos, Konetas, Paraskevas and Grigoropoulos address new perspectives for community building through communication, collaboration and information sharing. The authors focus on a pilot e-course implemented on the Greek teachers' national intranet e-learning platform aiming to provide evidence that the learning situation requires the mediation of improved Open Source Systems (OSS). In these systems, design should aim for the encouragement of the users' cognitive and social presence to emerge so that knowledge can be constructed and professional development can be achieved through collaboration and critical reflection within an active online community. As conclusion, the authors claim that e-learning too grows rapidly and that Web 2.0 will change the way persons work and learn in everyday life.

Stoyanov and Kommers assert that explicit problem-solving support in concept mapping software produces a stronger effect than the implicit support afforded by the graphical functionality of concept mapping software. This paper reports on an experimental study that tests this assumption as measuring the effect of two types of concept mapping software on problem-solving performance, mapping production and perceived problem-solving effectiveness of 47 students randomly assigned to an experimental and a control group. The experiments confirmed most of the predictions on the effect of different types of instrumental support on problem-solving performance. The strong positive correlation between knowledge elicitation, knowledge reflection and knowledge creation provides evidence that the good job done during map production can be a strong predictor for the successful solution of the problem as well. The data showed topics for future research: first of all the determination of the potential of cognitive mapping for reducing cognitive load and also the need to explore the effect

of individual problem-solving styles through cognitive mapping on problem-solving performance.

Technological issues

LOCO-Analyst by Jovanović, Gašević, Brooks, Devedžić, Hatala, Eap and Richards addresses the problem of bridging the divide between students and learning content designers. The Learning Object Context Ontology (LOCO) framework regards learning objects as a test bed intertwining learning activities, learning objects and learners with semantic annotations as the thread linking all these components. Feedback types are embedded and analysed to improve the quality of web-based learning content. Currently, most feedback about learning experiences is given on a course level. This paper presents an approach how the feedback loop between learners and content authors/teachers can be improved through the use of semantic web technology and ontologies. This feedback should follow a lower granularity on the level of the learning object. The LOCO framework is introduced and its implementation in the Reload Editor is discussed. Several types of feedback that the system can deliver are explained. Three different ontologies, which build the foundation of the system, are presented in conjunction with the architecture. The paper summarises an evaluation that was conducted. The results of this evaluation are presented and future work is discussed.

In the contribution of Janssen, Berlanga, Vogten and Koper, the authors introduce a model for a learning path specification. They formulate requirements for such a specification based on a review of existing literature on curriculum design and lifelong learning and on recent initiatives aimed to enhance comparability and exchangeability of learning actions. The model, which is based on the IMS Learning Design (IMS-LD) specification, defines a learning path as the learning actions involved to attain a competence or competence profile. Some limitations are discussed and a research outlook is provided.

Glahn, Specht and Koper present an overview on using indicators for learner support. A hypothetical scenario explains the application of such indicators. The authors introduce the learning interaction cycle as a theoretical model to define requirements for what the authors coin as 'smart indicators'. Based on this model, an analytical framework consisting of four layers is introduced for reviewing existing indicator solutions. The review analyses the existing solutions on each of these four layers. The paper rounds up with conclusions and further questions to be researched in the future.

de Jong, Specht and Koper present in their paper a reference model for mobile social software. On the basis of an educational discussion of mobile learning, the authors classify several mobile social software applications for learning regarding content, context, purpose, information flow and underlying pedagogical model. This classification ends up in a reference model for mobile social software for learning. Some limitations of current applications are discussed and suggestions for improvements are summarised. The 'ContextBlogger' application is presented and its implications and future research directions are discussed.

Assessment issues

Lee talks about how an integrated methodology might address the issue of time needed to formulate strategies and identify evaluation criteria to meet objectives, to address the

holistic issues and a need to prioritise these strategies that might support the achievement of objectives for the evaluation. This approach is simulated by strategies for learning design.

As an overall message in this special issue, reference modelling highlights commonalities among models and contexts of application. As such, it forms an ontological basis for strategic planning of organisational resources and creates opportunities for identifying organisational or collaborative pedagogical best practices. If innovation in pedagogical practices is the key to more effective learning, sharing and interoperability, then synergy between disciplines should be treated with higher priority. Some of the interdisciplinary synergies we have addressed concern ontologies, system design and assessment of pedagogical effectiveness. These form the key components in the educational ecosystem, an ecosystem interdependent on each component to evolve and move forward parallel to common objectives. This is the essence of the underlying special issue.