Editorial

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Biographical notes: Lorna Uden is an Emeritus Professor of IT Systems in the Faculty of Computing, Engineering and Technology at the Staffordshire University. Her research interests include technology learning, HCI, activity theory, big data, knowledge management, web engineering, multimedia, e-business, service science and innovation, mobile computing, cloud computing, social media, internet of things and problem-based learning.

Welcome to V10N4 of *IJLT*. There are four papers in this issue. The first paper is, 'Using learning analytics to enhance UML use case diagrams assimilation in a distance education course' by Panagoula Tsarmpou and Efthimios Tambouris. In this paper, the authors investigated the potential of employing learning analytics techniques to support distance education students in learning UML. They have developed an e-course as supplementary material for students attending a systems analysis and design postgraduate course at the Hellenic Open University. The e-course focuses on UML use case diagrams. They subsequently evaluated students' assimilation of use case diagrams concepts as well as e-course content and structure through use of learning analytics tools.

The results enable the authors to relate performance with students' participation, attendance and engagement, to identify common UML misconceptions and to evaluate the effectiveness of different learning objects for the task at hand. The overall information derived from applying learning analytics methods on the developed e-course indicates that their intervention on the HOU distance course was advantageous. It shows that the number of learning objects viewed and the lack of students' engagement have a strong impact on their final grade in the e-course. These authors were able to identify which use case diagrams concepts require more emphasis in teaching, which learning object types are most accepted by students and which ones produce richer data about the learners. In the experimental use of the e-course, the authors were able to identify the most common mistakes students make when designing a use case diagram. It would be interesting to attempt similar experimental e-courses covering other major UML diagrams.

The second paper is 'A case study to validate the PROXYMA approach to share and analyse contextualised interaction trace corpora in a TEL environment' by Hajer Chebil, Christophe Courtin and Jean-Jacques Girardot. In this paper, the authors present a framework to deal with the issue of sharing and analysing contextualised learning trace corpora through an experiment they have carried out in a real classroom at their university. They used two external analysis tools with two different trace formats.

According to these authors, the aim of the research was to allow researchers using TEL environments in their research work to share contextualised learning trace corpora and analysis tools to process such corpora. They tried to answer the following three research questions:

1   How could a learning trace corpus model be created and shared in order to allow analyses by taking into account its context?

2   How could the interoperability between different corpora models and specific input/output trace formats of analysis tools be defined, without imposing a new representation of traces as a condition of sharing?

3   How could analytical work carried out on one or several corpora be represented and integrated, so that they can be reusable by other researchers for verification, comparison, or further new analyses?

With this study, these authors argue that they have achieved their goals presented through the three research questions. Sharing corpora coming from different learning environments and contexts help them better validate their models and particularly the semantic model which could certainly be enriched. Present and future work would be useful to develop an integrated open platform accessible for researchers to share different types of corpora, and different analysis tools.

The third paper is 'Research trends in student response systems: a literature review' by Abdulaziz Aljaloud, Nicolas Gromik, William Billingsley and Paul Kwan. According to these authors, the use of student response systems (SRS, also known as clickers) in the classroom setting has increased considerably, and researchers have developed a growing interest in their effect on learning and student engagement. In this paper, the authors present a literature review of SRS. As the literature demonstrates, SRS has proven to be an effective tool in helping students to learn and in helping teachers instruct more effectively. Research conducted in the last fifteen years has demonstrated encouraging possibilities in the areas of interactivity, academic performance and learning, and student engagement. The review also reported considerable drawbacks of SRSs, including increased time demands, academic inefficiency, and practical barriers to its effective implementation.

In addition, this review focuses on the pedagogical implications of SRSs for education and analyses common criticisms of this emerging educational technology. Finally, research identifying common trends in SRS development is compiled and areas for future research are identified. This review analyses trends in SRS research by providing a brief history of SRS technology and usage as well as a detailed review of research in this field. In addition, this review focuses on the pedagogical implications of SRSs for education and analyses common criticisms of this emerging educational technology. Finally, research identifying common trends in SRS development is compiled and areas for future research are identified. The outcome of this leads to an understanding of best practices for this technology in a university setting.

The fourth paper is, 'An individualised navigation's assistance approach: application and evaluation with the HiPPY prototype' by Mahdi Miled, Mona Laroussi and Christophe Reffay. This paper introduces a methodology to build a specific kind of an adaptive hypermedia from the graph of epistemes model. The authors of the paper describe how to setup an adaptive hypermedia based on a fine grain learning resources called epistemes. This epistemic HyPermedia to learn PYthon language (HiPPY) is based

on a graph of epistemes, a dynamic navigation and an individualised epistemic diagnosis. The process of usage analysis should enclose, building resources and pathways, installation of indicators from traces and mining educational trends.

Using a case study, these authors applied this process to integrate the HiPPY tool into the France-International Olympiads in Informatics (IOI) platform. France-IOI non-profit association is to prepare French teenagers for IOI. From the collected traces, they were able to remodel traces and introduce a new type of trajectory embedded into the two existent ones (initially in the France-IOI platform). They used data mining algorithms and techniques, to categorise dominant profile users, to study trajectories and characterise solving process. Two main strategies were identified: one as a knowledge consolidation and another one as a resolution support. The authors also provide new original elements concerning connecting effective traces and declarative ones to confirm or invalidate several hypotheses taking care of privacy issues. Further research is needed. Potential reuse of these data with data mining and smart visualisation techniques may contribute to educational data mining or learning analytics fields.