Workshop on Technology-Enhanced Formative Assessment (TEFA) 2013 in conjunction with the Eight European Conference on Technology Enhanced Learning (EC-TEL) 2013, Paphos, Cyprus

Editorial

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1   Motivation

Today, learning often occurs collaboratively in learner networks, formal learning is combined with informal learning, and learners increasingly use personal and personalised learning environments adapted to their needs and preferences. In this scenario, providing feedback during self-regulated learning sessions is essential to support self-monitoring. Amongst other possibilities, formative assessment is a means to continuously generate feedback and to increase learners' awareness about their learning progress as well as motivation. It has already demonstrated its positive impact on learning in general, and it can help learners to become self-regulated learners.

Technology-based assessment has its origin in the early nineties where paper-pencil test were replaced more and more by assessment using technologies. Technology-based assessment become relevant in the context of adaptive testing and today, assessments are part of many learning environments with a large variance in item types.

While in a general sense any assessment can be used for formative or summative purposes, more genuinely formative assessment needs to provide (a) rich, detailed information on learning (content *and* process), (b) information that provides guidance on how to improve learning, and (c) opportunities to construct actively an understanding to regulated learning, and negotiable amongst the stakeholders. Furthermore, in-

formation technology allows not only the generation of feedback based on dedicated assessment (e.g. tests, quizzes), but also the use of a wider range of assessment items (e.g., free text) and, indeed, to exploit the information contained in the work/learning process (e.g. log files analysis of student activities in a virtual learning environment).

From a visionary perspective, technology-enhanced formative assessment will be integrated seamless in diverse technical learning environment, where it offers personalized learning experiences in different contexts, for everybody and for many relevant skills of the 21st Century. The concept of feed forward will be in place, i.e. the feedback provided will not only provide dedicated feedback about a particular test performance but also help the learner to select the next learning step, which might lead to an undiscovered new learning topic, a relevant skill for the near future or even support a career transition by providing a complete learning path.

2 TEFA workshop

On these bases, the TEFA workshop (Technology-Enhanced Formative Assessment, http://www.kbs.uni-hannover.de/tefa2013.html) focused on formative assessment as a support for learning in today's innovative technology-enhanced learning (TEL) environments, and as a component for extending existing or new TEL approaches. The goal was to develop the notion of technology-enhanced formative assessment further combining expertise from pedagogy, educational measurement, cognitive science, and information technology.

The event was initiated by the special interest group on Technology Enhanced Assessment (SIG TEA) and the European Association of Technology-Enhanced Learning (EA-TEL: http://ea-tel.eu); it was held in September 2013 in conjunction with the 8th European Conference on Technology Enhanced Learning 2013 in Paphos, Cyprus.

The workshop provided an opportunity to bring together experts from different fields: technology-based assessment, educational measurement, IT&TEL, pedagogy, teacher education, educational psychology, etc., willing to share their experience about their work in the field of technology-based learning and to provide insights about how formative assessment could enhance motivation and learning in TEL environments.

These proceedings collect contributions of the best papers presented at the workshop providing an interdisciplinary forum in which scientists and practitioners exchange new ideas and applications on technology-enhanced formative assessment.

The main research questions addressed in this collection are
How are established forms of formative assessment changing with the inclusion of technology and what new forms of formative assessment become possible? How is this reflected in new pedagogical approaches? How can today VLE support the provision of elaborated feedback?

3 Workshop contributions

The following contributions led to a successful workshop:

- Rusman et al. (Towards the Use of New Methods for Formative e-Assessment of 21st Century Skills in Schools) present the preliminary work developed in the PREATY project (http://portal.ou.nl/en/web/preaty) that aims to make primary and secondary school teachers aware of the use and benefits of modern e-assessment methods and tools.
- Cheniti and Garlatti (Semantic Web Technologies for Supporting Pervasive Peer Assessment) discuss the possibilities to produce peer learner assessment in Inquiry Based Learning (IBL) environments and propose a description of main semantic models needed to produce peer assessment activities in the learning process.
- Fotaris and Mastoras (Integrating IRT Analysis into LMS for Item Pool Optimization) introduce a methodological and architectural framework which embeds an Item Response Theory (IRT) analysis tool in a learning Management system (LMS) so as to extend its functionality with assessment optimization support.
- Rosmalen et al. (Towards App-based Formative Feedback to Support Summarizing Skills) discuss the design of an app which aims to enhance summarizing skill acquisition and, hence, text comprehension of secondary education students by providing just-in-time, formative feedback as part of summarization activities. This contribution builds on prior, recent research, showing that automatically created visualisations can be used to support writing.
- Di Mascio et al. (Play and Learn about Your Learners to Early Form your TEL Design) describe the co-design and gamification process conducted in the TERENCE project (http://www.terenceproject.eu) that developed a technology-enhanced learning system for supporting primary school children and their educators. The paper explains what triggered the gamification of the field studies, as well as how the gamified field studies were used to inform the early design of the TERENCE system and the pros and contras of such gamification.
- Kawase and Parmaxi (Online Student Engagement as Formative Assessment) present a formative assessment experience from a teacher's perspective during an intensive Greek language course effective learning improvement. They suggest that, given a digital learning environment and the support of learning analytics, it is possible to infer input for formative assessments.

4 Workshop Outcomes

The fruitful discussions over TEFA topics between the organizers, contributors and the audience have led to the following outcomes:

- Move from knowledge-based to competence-based assessment with appropriate formats
- Support learners in self-monitoring and self-assessment (incl. teaching them to do it)

- Involve learners in the design of assessment and feedback
- Training on assessment for tutors essential for uptake of TEFA in TEL
- Balance R&D with regard to the different core competences (currently unequal)
- Develop ICT environment and tools allowing teachers to quickly, easily and flexibly create customized electronic learning and assessment environments
- Realize authentic real-world assessment scenarios
- Develop guidelines, specification and standards for formative assessment (e.g. peer- and self-assessment)

5 Program Committee

- Beatriz Florian-Gaviria
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Acknowledgements

Biographical notes.

Eric Ras received his Ph.D. in computer science from the University of Kaiserslautern, Germany. He has worked for more than 15 years as a scientist and project manager on different public and industrial projects in the domain of teczhnology-enhanced learning and knowledge management. At the Public Research Centre Henri Tudor he is R&D Manager where he is recruiting and supervising researchers, PhD students as well as Postdoctoral Fellows in the fields of technology-based assessment

and learning. The goal is to enhance knowledge-based approaches and technologies with innovative human-computer interfaces (e.g., tangible user interfaces and dialogue based systems) and semantic technologies. In the domain of TEL, he concentrates on e-assessment of 21st Century skills. He leads the SIG on *technology-enhanced assessment and feedback* (hosted by the European Association of Technology-Enhanced Learning) and gathered research experience in FP5/FP6/FP7 projects. He chairs the *International Conference on Computer Assisted Assessment* 2014 and is guest editor of several upcoming journals issues on technology-based assessment. He is the author of over 100 scientific publications. He is PC member of different conferences in the domain of TEL and knowledge management and lectures at different universities.

Mohammad AL-Smadi is an Assistant Professor at Jordan University of Science and Technology (JUST), Jordan since February 2014. Before joining (JUST) in he was a postdoctoral researcher at the Center for Educational Technology (CET), Tallinn University. Dr. AL-Smadi holds a Doctoral degree in Engineering Studies (Computer Science) form Graz University of Technology with distinction, 2012. His research interests are in the domains of Human-Computer Interaction, Technology Enhanced Learning, Social and Semantic Computing, and Information Search and Retrieval. Before joining CET, Dr. AL-Smadi was a researcher at Graz university of Technology and participated in EC-Funded Projects and in some other national and internal research projects. Since 2013, Dr. AL-Smadi is currently taking part in the Learning Layers project –large scale project - applying his experience in the R&D of the Social Semantic Services to provide Meaningful Learning at workplace. He has published about 30 scientific publications in peer-reviewed journals, and conferences and earned an outstanding paper award (CAA2012 conference) and a best paper award (MIPRO2009 conference).

Ivana Marenzi, throughout her career, has specialised in the relationship between technology and communication. After her initial experiences as an ICT technician at the University of Pavia (Italy), she joined the L3S Research Center of the Leibniz University of Hanover in Germany (www.L3S.de) as part of her PhD program on the interplay between CLIL (*Content and Language Integrated Learning*) and Web 2.0. During the past four years she has worked as educational technologist. Her main area of research in Technology Enhanced Learning includes the support of collaborative and lifelong learning.