

Preface

With great pleasure we publish the Joint Proceedings of the 1st Co-Creation in the Design, Development and Implementation of Technology-Enhanced Learning workshop (CC-TEL 2018) and Systems of Assessments for Computational Thinking Learning workshop (TACKLE 2018). Both workshops were co-located with the 13th European Conference on Technology Enhanced Learning, which took place 3-6th September 2018 in Leeds, United Kingdom.

CC-TEL 2018

Co-creation is a term encompassing various forms of active stakeholder engagement and collaboration, including co-design, co-production, participatory design, Living Labs and DevOps. It has a strong ethos of valuing and involving the experience, expertise and creativity of all members of a user community and society more widely (Sanders & Stappers, 2008), and is an important aspect of the EU's Responsible Research and Innovation agenda and part of the 'Science with and for the Society' objective (Horizon 2020, 2018). The case for co-creation is multifold: (i) wider and more efficient adoption of research and innovation, (ii) innovation that is more relevant and responsive to society, (iii) integration of society in innovation, and (iv) stronger ties of innovation with the individual end user/consumer.

Within the TEL domain, co-creation plays a particularly important role as design and development move from relatively well understood school-based or formal learning contexts into less structured and less well understood areas such as informal learning, workplace learning, and continuing professional development. Crucially, the use, effectiveness, and impact of these co-creation approaches in the TEL community needs to be better understood.

This first workshop on Co-Creation in the Design, Development and Implementation of Technology-Enhanced Learning (CC-TEL) aimed to identify a community of TEL researchers and practitioners who will be able to collectively take this work forward. The goals of the workshop were: (i) exchanging experiences of implementing co-design, (ii) identification of common issues and challenges, (iii) starting to build a community of co-creation in TEL.

The seven papers presented in this volume address a variety of co-creation topics across a range of domains. They contribute both conceptual work (a knowledge appropriation model for analysing co-creation activities, linking self-determination theory and co-design, proposing co-creation of algorithms, pipeline for co-creating digital content) and practical case studies (co-creating assessments, co-creation in primary STEM education, co-creating a learning design tool).

TACKLE 2018

Computational thinking is nowadays considered as a key set of skills that must be acquired and developed by today's generation of learners, and there is now consensus that it should be taught both in the context of STEM and other subjects. However, an agreement is missing on computational thinking assessment. Grover and Pea make the gravity of this gap clear: "Without attention to assessment, computational thinking can have little hope for making its way successfully into any K-12 curriculum".

Several approaches to computational thinking assessment have been developed from different perspectives. However, in order to reach a comprehensive assessment of computational thinking learning, a system of assessments must be applied, i.e., a combination of different types of complementary assessments tools to integrate multiple assessment approaches and measure cognitive, social, and programming skills/attitude. The same need can be generalized to each curriculum that aims at enhancing the development of 21st century skills: besides technical skills, other skills need indeed to be evaluated such as critical thinking, creativity, communication, and collaboration. The issue of assessment is critical, because assessment not only determines whether or not didactic goals are being met, but also drives the design of a curriculum.

This first workshop on Systems of Assessments for Computational Thinking Learning (TACKLE) aimed at providing the opportunity to the TEL researchers to discuss and share their ideas on computational thinking assessment. Moreover, the workshop wanted to facilitate interdisciplinary collaboration among the participant researchers: CT assessment needs, in fact, to include not only technical and domain-specific skills, but also domain-independent meta-skills.

The papers presented in this volume explore this subject from different perspectives. They introduce different approaches to collect and combine evidences about the development of computational thinking skills in different learning environments (namely secondary school and postgraduate education) and to understand the effect of computational thinking learning on pre-service teachers' computer anxiety.

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