Workshop Proposal

Exploring and making online creative digital maths books for CMT.

Keywords: technology, MC-squared project, c-books, Creative Mathematical Thinking.

Workshop proposers

Description of the background and expertise of the proposed organisers.

The workshop proposers have a varied background of maths education and technology specialisms.

- **Pedro Lealdino Filho** (leader) is a maths specialist at Scientific and Technologic Education from UTFPR (2012) with a Master's degree in Teaching Science and Technologies at UTFPR
- (2014). At present he is pursuing a Ph.D. in Mathematics Education from Université Claude Bernard - Lyon (France). He contributes to several European projects like MCSquared, MathGeAr, MetaMath and JEN.Lab.
- **Christian Bokhove** is a lecturer in Mathematics Education at the University of Southampton, United Kingdom. He is specialised in procedural and conceptual understanding in maths education, technology use in maths education, large-scale assessment (TIMSS, PISA) and social network analysis.
- **Jean-Francois Nicaud** is a retired professor in Computer Science of the University of Grenoble 1, France. He was the head of a research team in interactive learning environments for learning algebra.
- **Ulrich Kortenkamp** is Professor of Mathematics Education at the University of Potsdam. His research interests include digital tools in mathematics education, in particular for Geometry and Arithmetic. For about 20 years he is one of the authors of The Interactive Geometry Software Cinderella
- **Mohamed El-Demerdash** is Post doctoral researcher in mathematics education at the University Claude Bernard - Lyon (France) and a lecturer of mathematics education at Minoufiya University (Egypt). He is specialized in teaching and learning mathematics for mathematically gifted students, technology use in mathematics education, and promoting creative mathematical thinking.
- **Manolis Mavriks** is a Reader in Learning Technologies at the London Knowledge Lab (LKL). His research interests, lie at the intersection of mathematics education, human-computer interaction and artificial intelligence. He has been designing and evaluating intelligent technologies that provide feedback to learners and increase teachers' awareness of the processes involved in learning.
- **Eirini Geraniou** was working as a full time research officer on the MiGen project at the London Knowledge Lab. Before joining the MiGen team in January 2008, she worked as a mathematics teacher at Trinity Catholic School at Leamington Spa.

Description workshop

Detailed description of the topic theme including anticipated aims and a rationale of the planned discussion group.

When we look at e-books, designed for mathematics education, we can distinguish two streams. On the one hand we see publishers of traditional Mathematics textbook come with digital versions of their products, mostly static pdf-documents that can be downloaded and used on different devices. Anticipating on new interactive possibilities, sometimes limited interactivity is built in. On the other hand we see innovative groups of designers that traditionally develop highly interactive tools and micro-worlds for mathematics education. Initially many of these tools were implemented as standalone applications. More and more these tools are integrated with written tasks, producing interactive worksheets, dynamic web pages and e-books for maths. The European 'MC-squared' project aims to start several so-called 'Communities of Interest' (CoI) in a number of European countries (Fischer, 2001) that work on digital, interactive, creative, mathematics textbooks, called c-books. The c-books are authored in the MC-squared platform in which authors can construct books

with various interactive 'widgets'. This workshop aims to introduce the project and acquaint participants with the affordances and authoring process of the MC-squared platform.We ask participants to bring technology; any device for exploring c-books, a Java-supporting device for authoring c-books.

Key aim of the workshop

Key questions and issues for the Discussion Group or the Workshop to consider.

The key aim for the workshop will be to show how the MC-squared platform can be conducive for the creative process of designing interactive, electronic books for mathematics (c-books).

Structure

A precise description of the anticipated structure. A description of how the time will be used in order to allow maximal participation of all workshop participants.

In this 90 minutes workshop participants will experience the following four elements of the project:

1. Be given a short overview of the MC-squared project and the architecture of the authoring platform (15 minutes);

2. Be shown one example of c-book unit "Experimental Geometry" viewing how the different widget factories perform inside the c-book and also the Creative Mathematical Thinking affordances present in the c-book (15 minutes).

3. Learn how to author a simple, interactive c-book (45 minutes);

4. Get acquainted with a selection of other MC-squared platform features like storing of student work and checking of answers (15 minutes);

For elements 1, 2 and 4 participants can follow along with the presenters. Element 3 will be completely hands-on: participants will be provided with an account and hand-out, and will be able to actively explore the MC-squared platform. The presenters will walk around the room for one-to-one support. To maximise the usefulness of the workshop it is preferable that participants bring their own devices; for authoring these need to be Java enabled devices for example a laptop, for watching c-books any HTML5 supporting device (like tablets) will do .

References

Fischer, G. (2001). Communities of interest: learning through the interaction of multiple knowledge systems. In the Proceedings of the 24th IRIS Conference S. Bjornestad, R. Moe, A. Morch, A. Opdahl (Eds.) (pp. 1-14). August 2001, Ulvik, Department of Information Science, Bergen, Norway.