

# Exploring and Making Online Creative Digital Math Books for Creative Mathematical Thinking

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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 textbooks have digital versions of their products, mostly static pdf documents that can be downloaded and used on different devices. In anticipation of new interactive possibilities, limited interactivity is sometimes built in. On the other hand, we see innovative groups of designers that have started to develop highly interactive tools and micro-worlds for mathematics education. Initially, many of these tools were implemented as standalone applications. These tools have been increasingly integrated with written tasks, producing interactive worksheets, dynamic web pages, and e-books for math. In some European countries, the M C Squared project has aimed at starting several so-called Communities of Interest (CoI) that work on digital, interactive, and creative mathematics textbooks called c-books. The c-books are authored in the M C Squared platform, where authors can construct books using various interactive “widgets.” The workshop aimed to introduce the project and acquaint participants with the affordances and authoring process of the M C Squared platform.

A short overview of M C Squared and the architecture of the authoring tool platform was given, showing the possibilities of creating c-books individually or collectively. An example of a unit of a c-book, “Experimental Geometry” (Fig. 1) was given showing the different widget factories and how they perform inside the c-book and the creative mathematical thinking affordances present in the c-book.

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The screenshot shows an interactive learning interface. At the top, it says 'MC<sup>2</sup> >> C3\_Experimental Geometry'. Below that is a blue header with 'Loci of special points in a triangle' and an 'Edit' button. The main content area is titled 'An Equation for the Locus'. It contains two numbered instructions: 1) Dragging vertices A and B, or moving point C along line L to find the locus of point D. 2) Finding an equation for the locus. To the left is a coordinate plane with a triangle ABC, a horizontal line L, and a dashed orange locus for point D. To the right is an interactive calculator with a 'Draw function' button and a text input field containing 'y = 3x'. Below the calculator is a chat icon and a 'Next page' link. At the bottom, a progress bar shows 'Problem: 1 2 3 4 5' with '3' highlighted, and 'Score: Total: 0'.

Fig. 1 Screenshot of a c-book page showing the widgets: Cinderella, EpsilonWriter and EpsilonChat

Another goal of the workshop was to teach participants how to author a simple interactive c-book and explore existing resources created along the duration of the project. The participants got acquainted with a selection of other M C Squared platform features such as student work storage and answer checking.

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