A heady brew: designing filtered mathematics education research documents (Espressos) for teachers

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Introduction
Cambridge Mathematics

Cambridge Mathematics is a collaborative organisation at the University of Cambridge, bringing together the expertise of the Faculty of Mathematics, the Faculty of Education, Cambridge Assessment, and Cambridge University Press to create and support a framework for mathematics education for all students aged 3–19. We are developing a flexible and interconnected digital Framework to help reimagine mathematics education 3-19. Our design process is transparent, collaborative and research- and evidence-informed.

We think mathematics learning 3-19 can be more connected and coherent and we are providing a structure to make this happen.

We are working with specialists in mathematics education all over the world and expect to have an initial version ready by 2020. The framework emphasizes connections between mathematical ideas that support students in building mathematical understanding, using a structure based in the activity design work of the Shell Group at the University of Nottingham. During our work on the framework, immersing ourselves in the latest and most seminal mathematics education research, we wanted to create documents for teachers that would help make some of these important ideas accessible and applicable to the classroom.

The brief: design principles and constraints

We set up a list of design criteria (and limitations in scope) for these documents, which reflected many of the aspects of the Framework:

• based on as objective as possible a review of the current research literature, while acknowledging limitations of person-power, time, and inevitable bias
• written as a two-page document
• containing an attractive and accessible well-constructed mathematical diagram
• fully referenced, with hyperlinks to original research
• clearly focused on one significant question or a time, not attempting to tackle questions too broad or nebulous
• using clear and unambiguous language: defining terms where appropriate

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Examples

The following are some of the documents produced by others that exemplify some (but not all) of our design principles for Espressos:

Recent Research in Mathematics Education 5-16
Cambridge Mathematics

MESH guides (www.meshguides.org)
For example, Mathematics and A level

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User feedback

We have also discussed this document informally with a number of researchers whose work has been included therein, and received some useful and positive feedback.

Questions and next steps

Feedback from organisations such as the National Centre for Excellence in the Teaching of Mathematics and the Mathematical Association and twitter engagement suggest the Espressos are being well received and that teachers are using them for CPD in mathematics.

Next steps include:

• a systematic review of downloads/read of Espressos and analysis of the data

• a mechanism for more detailed feedback after users have opened a systemic review of downloads/read of Espressos and analysis of the data

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We would like to consider the questions:

• How are the Espressos used?

• How can we ensure the research questions chosen are useful to the community of users?

Universally researchers are beginning to show an interest in collaboration with Cambridge Mathematics on these documents and work has begun on these specialisation 'Espresso Doppio'.