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# Factors impacting on the collaborative design of digital resources

[Nataly Essonnier<sup>1</sup>](#), [Berta Barquero<sup>2</sup>](#), [Christian Mercat<sup>1</sup>](#), [Mohamed El-Demerdash<sup>1,3</sup>](#), [Jana Trgalova<sup>1</sup>](#), [Mario Barajas<sup>2</sup>](#) and [Pedro Lealdino Filho<sup>1</sup>](#)

1 Claude Bernard University L- yon 1, S2HEP EA4148, Lyon, France;

2 University of Barcelona

3 Menoufia University, Egypt



Université Claude Bernard  Lyon 1

# Collaborative design context

- The collaborative design took place in the European project **MC Squared** (<http://mc2-project.eu/>)
  - Development of a **new** digital socio-technical environment  
→ **C-book technology**
  - Study of the design process in four **communities of interest (CoI)** (Fischer, 2001) and production of new digital resources  
→ **c-books**
  - Promoting the **Creative Mathematical Thinking (CMT)** in c-book users.
- Re-design of the c-book, called “Limits”, through the cross-collaboration of the French and Spanish CoIs.

# Study of the collaborative design process

Theoretical and methodological background

- **Networking of two theoretical frameworks**

- Documental Approach (DA) (Gueudet & Trouche, 2009) and,
- Boundary Crossing approach (BC) (Akkerman & Bakker, 2011).

- **Methodology**

The design process is seen as a documentational genesis (**DA**)

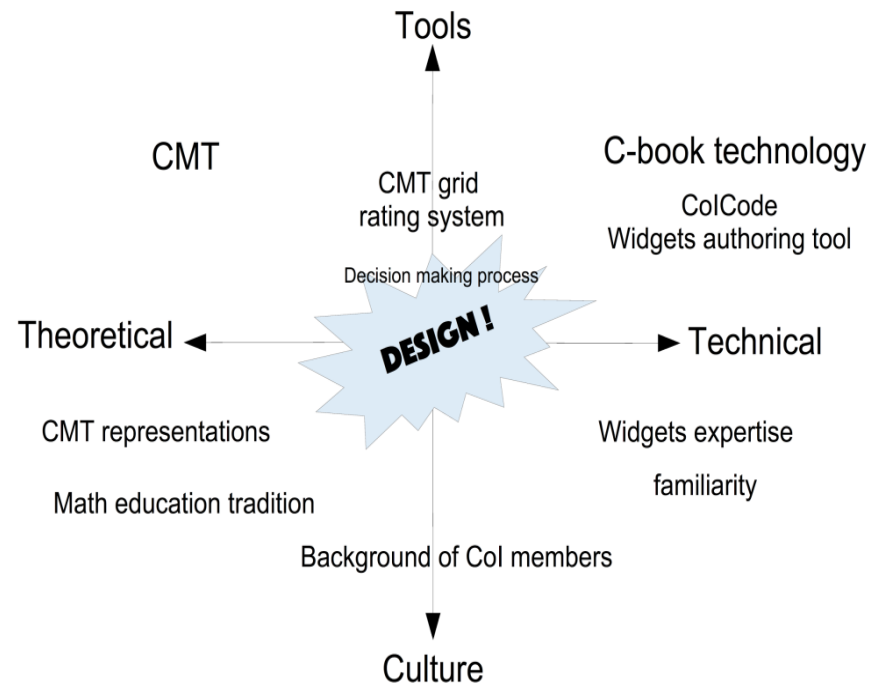
- resources (Adler, 2000) which sustained or hindered the design process and,
- resource versions (c-book versions) in order to highlight what happens between two versions.

The design took place in two cultural contexts, two worlds (**BC**)

- Boundary object (ideas, c-book versions, widgets, CMT grid, creative ideas score), and
- Mechanisms:
  - **Identification**: awareness of two cultural contexts allows to point out differences,
  - **Coordination**: de-contextualization and re-contextualization of the resource eased by the proximity of the cultures,
  - **Reflection**: perspective making and taking in relation with the communication workspace,
  - **Transformation**: pointing out differences, similarities within the c-book versions.

# Factors orienting the collaborative design

- Theoretical
  - representation of CMT based on fluency, flexibility, originality and elaboration (Torrance, 1968)
  - Creativity, “Middle c” perspective (Moran, 2010) and social creativity operational definition (Daskolia, 2015).
- Conceptual tools:
  - The CMT grid
  - The rating system in ColCode
- Technical context:
  - The collaborative workspace for communication: ColCode
  - Technical familiarity with the authoring environment and its widget factories
- Culture
  - Didactical traditions: French and Spanish
  - Designers’ background and expertise



# CERME10 Conclusion and perspectives on cross-Col collaborative task design

- The proximity of collaborating cultures is necessary to allow understanding through building of new norms and of a common language.
- The background of the designers impacts their attitude towards the tools, their CMT representations, their position in the collaborative decision making and the widgets they use.
- The designers' cultures evolved from the cross-collaboration.
- Different cultures enable to enrich the scope of the designed tasks.
- Tools and cultures shape the design process.



Thank you for your attention

#### References:

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# 1. Introduction: Task design in the MC2 project

- The main focus of our research is the **collaborative design** of a new kind of digital educational resources, the **c-book units**, where:
  - **Designers** of different background, expertise and interests, who constitutes the so-called **Communities of Interest** (CoI, Fisher 2001) jointly design **c-books** aiming to foster Creative Mathematical Thinking (CMT) to the final users,
  - The **process of task design** as well as the **affordances of the product itself** is on the focus of the research to identify their characteristics and their potential for the teaching and learning of mathematics.



- European Project **MCSquared** (October 2013-October 2016)  
<http://www.mc2-project.eu>

## 2. The cross-case design and evaluation of a c-book unit

