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AN ORIGINAL COLLABORATIVE PROJECT AROUND THE MODELLING IN PRIMARY FRENCH EDUCATION THROUGH VIDEO-BASED PROBLEMS

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Yvain-Prébiski Sonia

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Sonia Yvain-Prébiski

sonia.yvain@univ-lyon1.fr



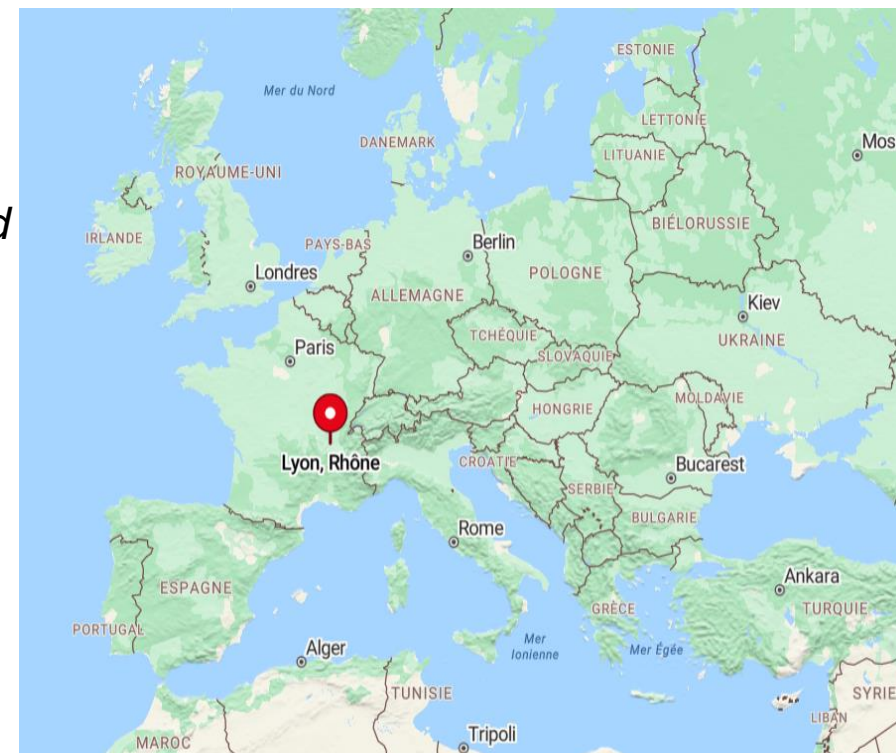
15th International Congress on
Mathematical Education

7-14 July 2024 • ICC Sydney, Australia

Come and be counted



- **Léa MaPcv** : a 3-year project funded by the French Institute of Education and the University Claude Bernard of Lyon.
a teacher-trainer-researcher team, working together to improve teaching and learning of modelling focusing on the issues of training in mathematical modelling for primary education teachers.



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- First research hypothesis : *Putting teachers and trainers in the position of designers of a problem rooted in reality, posed in video form, leads them to understand **the need to take account of the mathematization process in a modelling activity.** In other words, in the framework of RME, to go **back and forth between HM and VM.***

Treffers, in his thesis of 1978, distinguished horizontal and vertical mathematising [...]: Horizontal mathematising, which makes a problem field accessible to mathematical treatment (mathematical in the narrow formal sense) versus vertical mathematising, which effects the more or less sophisticated mathematical processing. (Freudenthal, 1991, p. 40)

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- Analysis of the potential of modelling created problem

Analyses planned : based on focuses on the task dimensions of mathematical modelling (Borromeo Ferri, 2018), crossed with Reality, Openness, Complexity, and Model Eliciting used by Doğan, M. F. (2020, 2023)

Criteria for Mathematical Modeling Problems

Criteria for Modeling Problems	Explanation	The guiding questions for the criteria
Reality	Problem includes a real world situation and the problem situation overlaps with the reality of the individual	<ul style="list-style-type: none"> • Does the problem involve a real world situation? • Does the problem situation include information and explanation that may be meaningful to the individual?
Openness	Problem is based on assumptions and predictions (interpretation) and open to different and original solutions	<ul style="list-style-type: none"> • Is the problem suitable for interpretation and assumption? • Are there different solutions to the problem?
Complexity	Having implicit mathematics in the problem and the individual's desire or need to solve the problem	<ul style="list-style-type: none"> • Does the individual feel the need to use mathematical ways to solve the problem? • Does the problem cause a feeling of complexity or helplessness for the individual?
Model Eliciting	Solving the problem according to mathematical modeling process	<ul style="list-style-type: none"> • Can the problem be solved by mathematizing the real world situation?

First results

Before the problem design sessions

Original

Fun

Encourages
discussion

Allow to do
maths in
different way

Gives
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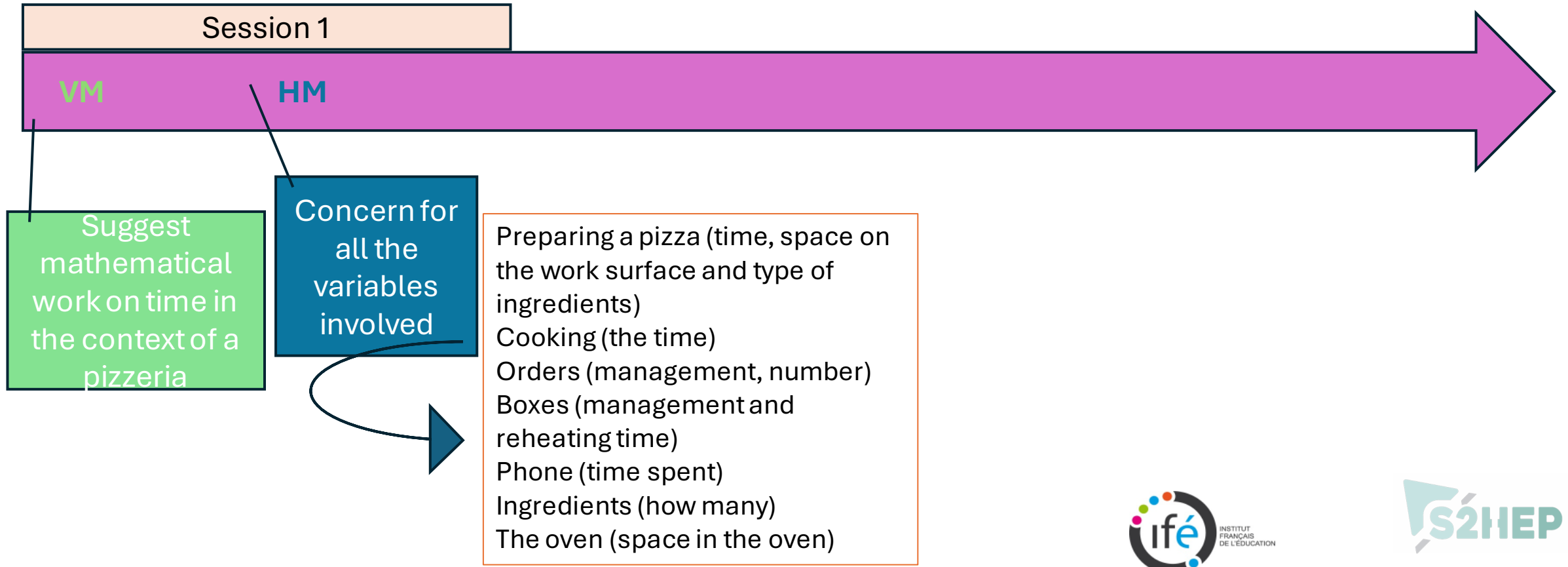
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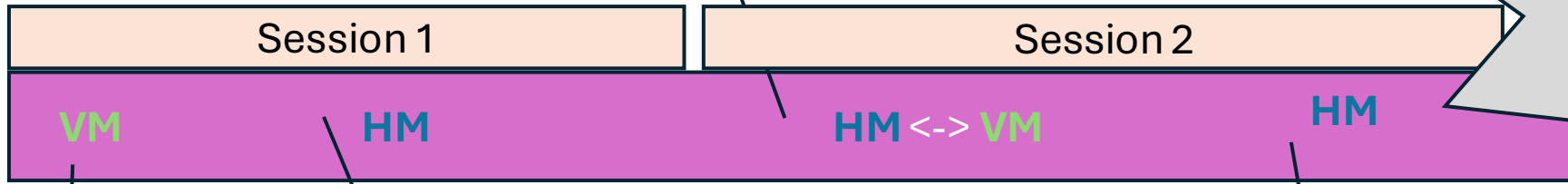
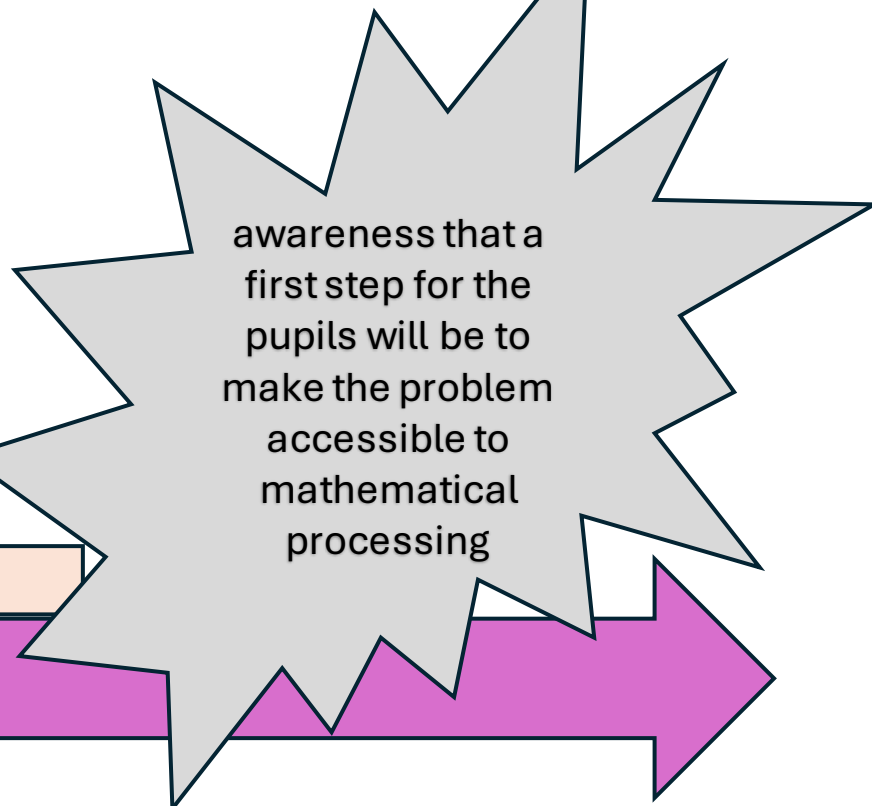
nothing about teaching modelling...

First results



First results

Concern to offer an authentic context and, at the same time, mathematical work that is accessible to pupils. Start of choices like an apprentice so as not to call into question the professional skills of the pizzaiolo



Suggest mathematical work on time

Concern for all the variables involved

- Preparing a pizza (time, space on the work surface and type of ingredients)
- Cooking (the time)
- Orders (management, number)
- Boxes (management and reheating time)
- Phone (time spent)
- Ingredients (how many)
- The oven (space in the oven)

Do not ask a question, but suggest a question about the preparation time, as the pupils will want to consider the different pieces of reality in the situation.

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Allow instrumented data capture (choose fast forward x8 when preparing 4 pizzas)



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Decisions to make different choices each time, with the aim of providing a "real" context and making mathematical work accessible to pupils

The problem created in the context of a pizzeria : will the pizzaiolo have time to prepare the orders he has accepted?



A brief summary:
at the opening (7 pm), an order of 24 pizzas for 8pm
At 7.30 pm, the apprentice accepts an order for 9 pizzas for 7.45pm
The boss tells him it's going to be complicated...

Unfortunately not enough time to show the video (it lasts 2 minutes)

Thank you

