

Teaching to reinforce the bonds between modelling and reflecting

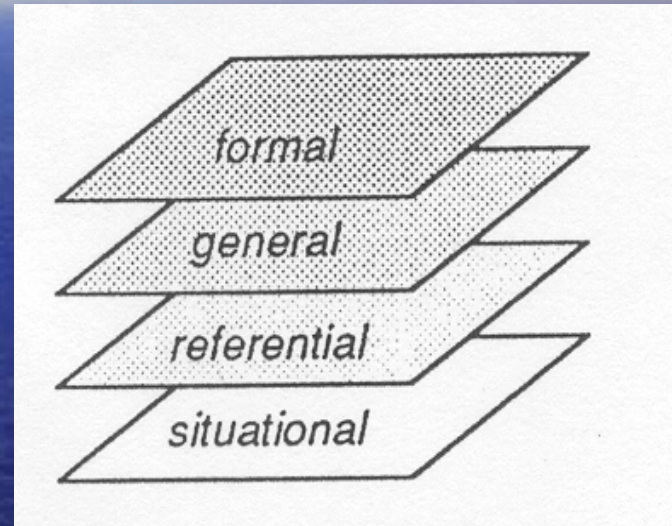
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RME: Mathematics is a human activity (Hans Freudenthal)

- Learning mathematics is guided reinvention by horizontal and vertical mathematizing
- Mathematizing is substantiated by reflections
- Students pass through four levels of activity: a new mathematical reality is created at each level



(Fig 1.) Levels of activity.
Gravemeijer, K. & Stephan, M. (2002). p 159

Reflections from a philosophical point of view

- The learning subject transcends the immediate object of his/her present consciousness
- Outcome: consciousness at a more general level, where the first object is situated in a broader context
- Outcome, in general: knowledge of relations between the first object and similar objects in the same class

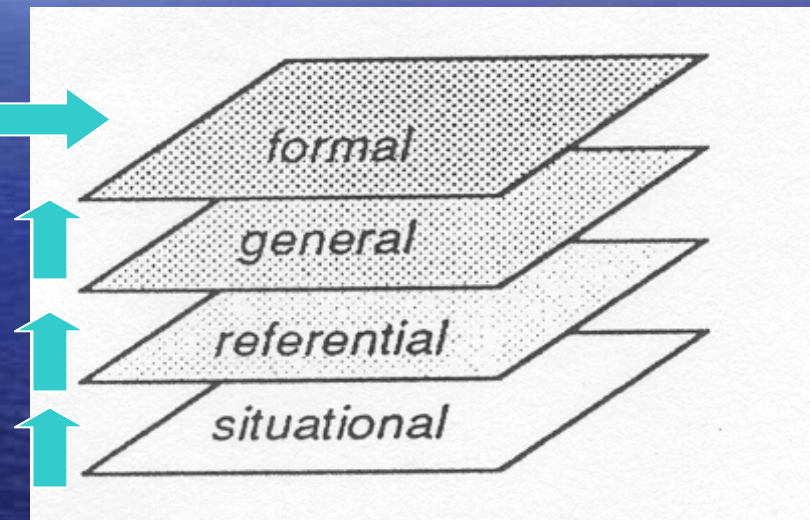
Philosophical reflections as a tool for mathematical reasoning

- 1) The level of the mathematician.
- 2) The level of the deliberately working mathematician.
- 3) The level of the philosopher of mathematics.
- 4) The level of the epistemologist.

(Prediger 2007) based on the stratification in (Neubrand 2000).

Levels of mathematical activity and reflections

- Epistemologist's reflections
- Philosopher of math's reflections
- Deliberated mathematician's reflections
- Mathematician's reflections



Stratification of mathematical reflections (Prediger 2007)

*(Fig 1.) Levels of activity.
Gravemeijer, K. & Stephan, M. (2002). p 159*

Use of the model – how?

The teacher has to:

- Identify points of interest in the processes of mathematising
- Formulate thought-provoking questions to guide the students' reflections
- Make the students' reflections explicit in classroom discussion/meta reflections

Use of the model – why?

Can't students just learn about mathematics by doing mathematics?

YES! At least, it is impossible to learn about mathematics without to do mathematics.

NO! Doing classroom mathematics is too complex, changing, focused on technicalities, language, social backgrounds and norms, applications and relations with other subjects, everyday life..

We must be carefully responsible rather than just optimistic!