

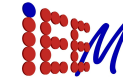
Mathematical Modelling in a European Context

A European Network Project

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ICME 11 – Monterrey (Mexico) –
11.07.2008

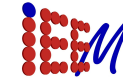




Content

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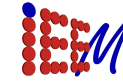




Very short overview about the project

- Funded by the European Commission for three years
- 34 Partnerinstitutions in 11 participating European countries
- Consisting of teachers, researchers, teacher trainers
- Four different foci:
 - Developing Material Group
 - Research Group
 - Teacher Training Group
 - Cooperation Group

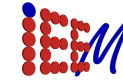




Aims of the research group

- To clarify learning objectives for the development of mathematical modelling competence
- To develop quality criteria for learning materials and teaching methods
 - Developing a checklist to identify „good (modelling) tasks“
- To develop and run a pilot study for cross-cultural comparisons of exemplary learning materials

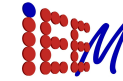




Approach of this preliminary study

- 1st Meeting in Bratislava → First draft of descriptors
- Testing of a task and a checklist in Germany
 - Video
 - Further questions
- Further development of the descriptors by members of the research group including first ideas for an Evaluation tool

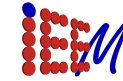




Checklist

Motivation	Engagement (personal and societal)	Doing the mathematics	Formalising and analysing the mathematics problem	
	Teaching Purpose		Using data	
	Authenticity		Approximation and estimation	
	Linking with existing mathematical knowledge		Use of ICT (software and graphics calculator)	
	Challenging		Use algorithms	
Systematisation & Mathematisation	Is data needed?		Mathematical common sense	
	Abstraction		Proof (validation of the mathematics used)	
	Assigning variables		Use of mathematical representations	
	Making assumptions		Interpretation and Validation	Validation of the solution mathematically
	Simplifying			Validation of the solution in the 'real world'
	Representation(s)	Are the results good enough?		
				Is another cycle needed?

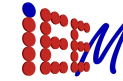




Questions

- Is the checklist manageable for teachers in terms of expenditure of time?
- Is the checklist manageable for teachers in terms of formulation?
- What is missing in this checklist?
- How could an evaluation tool of the checklist look like?





Questions

- Is the checklist manageable for teachers in terms of expenditure of time?
 - No. According to the opinions of all by now asked teachers
 - How can we shorten it?!





Questions

- Is the checklist manageable for teachers in terms of formulation?
 - Some tasks are not understandable for teachers (Representations etc.)
 - Problems of translations
 - Why does the teacher think that the given task did not include
 - “Abstraction”,
 - “Formalising and analysing the mathematical problem” and
 - “Validation of the solution mathematically”?





Questions

- What is missing in the checklist?
 - The connection to the group of pupils you want to present the task to.
 - Why does the teacher think that the given task did not include
 - “Abstraction”,
 - “Formalising and analysing the mathematical problem” and
 - “Validation of the solution mathematically”?
 - How good is this group in abstracting or structuring real life situations to make them fit into a mathematical model?
 - And is a deeper analysis of the solution necessary?

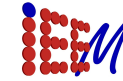




Questions

- How could an evaluation tool for the checklist look like?
 - Comments according to the task (Supporting this with exemplary answers)
 - Which descriptors are absolutely necessary for identifying a good modelling task?





Actual state of affairs

Motivation	Engagement (personal and societal)
	Teaching Purpose
	Authenticity
	Linking with existing mathematical knowledge
	Challenging
Systematisation & Mathematisation	Is data needed?
	Abstraction
	Assigning variables
	Making assumptions
	Simplifying
	Representation(s)

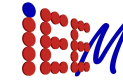




Actual state of affairs

Doing the mathematics	Formalising and analysing the mathematics problem
	Using data
	Approximation and estimation
	Use of ICT (software and graphics calculator)
	Use algorithms
	Mathematical common sense
	Proof (validation of the mathematics used)
	Use of mathematical representations
Interpretation and Validation	Validation of the solution mathematically
	Validation of the solution in the 'real world'
	Are the results good enough?
	Is another cycle needed?





Conclusion

- Evaluating which descriptors are necessary, which not.
- Evaluating if the necessary descriptors are valid
- Modify the formulation of some of the descriptors and shorten the checklist to make it more manageable for teachers
- Developing an evaluation tool for the checklist
- Testing the modified checklist with the same and other teachers





Thank you for your attention!

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