

Model- and Context-oriented Reflection in Mathematics Classrooms

TSG 23: Mathematical literacy

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Abstract

In maths education different types and steps of reflection are considered as essential to achieve mathematical literacy, in particular the ability to evaluate mathematics which is used to describe and impact our everyday surroundings. In my PhD-project I try to foster model-oriented reflection (how do models fit to situations – are they suitable for their purpose?) and context-oriented reflection (what is the social purpose of a model – what is the role of mathematics in this situation, what are the benefits and drawbacks?) at school (grade 8).

Keywords:

Conceptions for mathematical education
Reflection-stimulating-tasks
Students' responses

Schlüsselwörter:

Bildungskonzepte
Reflexionsaufgaben
Schüler_innenantworten

1 Introduction

The poster presents my approaches and first steps of the research, providing information to the following items:

2 Why such types of reflection?

Different conceptions for mathematical education emphasize the importance of reflection in general (Fischer 2012, Skovsmose 1998, Lengnink 2005). Model- and context- oriented reflections seem especially relevant, e.g. because they are required by consumers of mathematics. They address issues of the approach of mathematical literacy for “evaluating mathematics” (Jablonka, 2003, pp.89-90).

3 My understanding of model- and context- oriented reflection

Model-oriented reflection means thinking about characteristics of mathematical models which are not explicitly expressed. It includes reasoning about assumptions and idealizations or plumbing the constraints and prospects of the model. Context-oriented reflection means thinking about the role of mathematics for the specific context, in which it is used: What are the reasons and purposes of the model? Which benefits or drawbacks result in using mathematics in the specific situation?

4 Research questions

The main question of my research is, how and to what extent model- and context- oriented reflections can be stimulated in mathematics classrooms. This leads to some sub-questions relating to tasks stimulating reflection and students' responses to such tasks.

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5 What can be reflection-stimulating-tasks and how do students respond?

Reflection-stimulating-tasks should be short, like conventional tasks used in mathematics lessons, allowing to integrate them time and time again in conventional lessons, without spending whole hours or weeks just on this topic. As mathematical content serve percentages, functions or descriptive statistic which are often used in models or descriptions of our world of experience. The poster should illustrate some exemplary tasks with students' responses.

6 An outlook

This section presents some insights on the basis of first analyses of students' responses and gives an outlook to further investigation plans.

References

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