

# Kolloquium des Instituts für Mathematik und Informatik

Koordination: Prof. Dr. Sebastian Kuntze

## ... demnächst:

Bitte beachten Sie den  
früheren Vortragsbeginn!

Bitte beachten Sie  
die Raumänderung!

am 22.07.2009 um 12:15-13:45 Uhr in Seminarraum 1.210

Helena und Dirk Wessels, Stellenbosch University, South Africa

In zwei aufeinander bezogenen Kurzvorträgen:

Helena Wessels

## Mathematical Modelling for Pre-Service Foundation Phase Teachers

### Zusammenfassung/Abstract:

Mathematics on Grade 12 level is a requirement for prospective Foundation Phase teachers at Stellenbosch University in South Africa. Some of them, however, lack the confidence to teach mathematics while many were taught mathematics in a traditional way. The motivation to include modelling tasks in the Mathematics Education modules for Foundation Phase pre-service teachers is based on the fact that modelling provides the opportunity for them to expand their existing mathematical knowledge while developing complex and authentic thinking around their existing simple mathematical concepts (Niss & Blum 1991). Through modelling worthwhile mathematics is learnt and simultaneously the competency of applying mathematics and building models is developed (Niss, Blum & Galbraith 2007). The development of mathematical knowledge and skills promote self confidence and positive attitudes. Foci of the study include modelling competencies, types of representations, and beliefs and attitudes of the student teachers.

The 140 pre-service teachers working in 54 groups of 3 to 5 each completed a model-eliciting task in class over a number of periods totalling about 3 hours. On completion of the task, the student teachers had to present their group's solutions to the class, not only explaining their model, but also explaining the process the group went through in constructing the model. Afterwards individual questionnaires as well as group questionnaires were completed by the student teachers.

Piera Biccard / Dirk Wessels

# Documenting the development of modelling competencies of Grade 7 students

## Zusammenfassung/Abstract:

The need to research modelling competencies in a comprehensive manner has been recognised (Maaß 2006:113). This paper presents preliminary findings from a study investigating the development of modelling competencies of Grade 7 students. We focus on the empirical work conducted during qualitative research on twelve students working on modelling problems in group situations over a period of twelve weeks.

Modelling is a mathematical competence and a means of significant learning of mathematics in mathematics education. We explore the nature of competence and modelling competencies. The paper emphasises the development of competencies in the group as a whole as these competencies are often observable when students work in groups verbalising and representing their thinking. We elaborate on decisions made regarding the choice of groups, the tasks used and the design and use of qualitative instruments. We describe the process of the development of competencies using these instruments.

The data collected supports existing research that modelling competencies do develop when students take part in modelling courses (Kaiser 2007: 116; Mousoulides, Sriraman & Christou 2008: 9) and assists us present the metamorphosis of modelling competencies to create a broader picture of these competencies. Furthermore, the findings may assist in planning modelling courses for school implementation.