



TSG 22

MATHEMATICAL APPLICATIONS AND MODELLING IN MATHEMATICS EDUCATION

The Organizing Team

Chair: Gilbert Greefrath, University of Muenster, Germany

Cochair: Cristina Esteley, Universidad Nacional de Cordoba, Argentina

Members:

George Ekol, Kyambogo University, Uganda

Susana Carreira, Universidade do Algarve, Portugal

Xiaoli Lu, East China Normal University, China

Applications and modelling is a world-renowned field of research in mathematics education and has been an important theme especially during the last 50 years; and the importance has been growing worldwide during the last decade. This is evident, for example, in the International Congress on Mathematical Education (ICME) regular topic study groups and lectures on applications and modelling, and the series of conferences since 1983, of the International Community on the Teaching of Mathematical Modelling and Applications (ICTMA). This increasing interest is a consequence of, on the one hand the public demand for the relevance of mathematics outside mathematics, and on the other hand, an increasing number of research projects and empirical studies which focus on specific aspects of applications and modelling in mathematics teaching and learning. Many recent qualitative and quantitative research studies on modelling in school have focussed on students; however, teachers also play an important role in implementing mathematical modelling into mathematics lessons and in fostering students modelling competencies, which processes are studied accordingly. Furthermore, classroom settings also play an important role.

Enriching the focus on direct teacher behaviour in proposing and implementing interventional activities, there has been a research approach to the design of single modelling lessons as well as to the whole modelling learning environments at different school levels.

This topic study group (TSG 22) considers the importance of exploring relations between mathematics and the real world that occurs in educational environments. It also recognizes the value of examining the discussions in research and development on the applications and modelling issues at the primary, secondary and tertiary school levels, including mathematics teacher education. The

TSG also recognizes the interplay between research and development of modelling learning environments.

The discussions in TSG 22 include the following sub-themes:

- student's development of modelling competency through the teaching of applications and modelling
- teaching mathematical modelling from various perspectives such as mathematical, pedagogical-didactical perspectives and critical-societal or socio-political perspectives
- assessment practices (local, regional or international) of modelling activities; and difficulties with modelling activities at school and university levels respectively.
- use of technology and other resources in modelling activities and their impact on the modelling processes
- teaching practices, teacher education and professional development programs concerning the integration of applications and modelling in school and university mathematics programs.