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- What is a suitable balance within general education between creating one's own models of real situations and problems, and making judgements about models made by others?

### 3.6 MODELLING PEDAGOGY

The pedagogy of applications and modelling intersects the pedagogy of pure mathematics in a multitude of ways and requires at the same time a variety of practices that are not part of the traditional mathematics classroom. Approaches to teaching applications and modelling vary from the use of traditional methods and course structures, to those that include a variety of innovative teaching practices.

ISSUE 6. *What are appropriate pedagogical principles and strategies for the development of applications and modelling courses and their teaching? Are there different principles and strategies for different educational levels?*

Examples of specific questions:

- What research evidence is available to inform and support the pedagogical design and implementation of teaching strategies for courses with an applications and modelling focus?
- What criteria are most helpful in selecting methods and approaches suggested by theories of human development and/or learning?
- What obstacles appear to inhibit changes in classroom culture e.g. the introduction of interactive group work in applications and modelling?
- What criteria can be used to choose the most desirable option at a particular point within an applications and modelling teaching segment (e.g. whether to use individual and group activity)?

### 3.7 SUSTAINED IMPLEMENTATION

To sustain change in an educational system is a major challenge as it involves and impacts upon many different parties, including politicians, curriculum developers, teachers, teacher educators, and mathematics faculty members at the post secondary level.

ISSUE 7. *In spite of a variety of existing materials, textbooks, etc., and of many arguments for the inclusion of modelling in mathematics education, why is it that the actual role of applications and mathematical modelling in everyday teaching practice is still rather marginal, for all levels of education? How can this situation be reversed to ensure that applications and mathematical modelling is integrated and preserved at all levels of mathematics education?*

Examples of specific questions:

- What are the major impediments and obstacles that have existed to prevent the introduction of applications and mathematical modelling, and how can these be changed?
- What are the requirements for developing and sustaining a mathematical modelling environment in traditional courses at school or university?
- How can it be ensured that the mathematical modelling philosophy in curriculum documents is mirrored in classroom practice?