

# **Curriculum Changes - how to establish and to initiate**

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# Foreword

- Please **acknowledge work** and engagement **of mathematics teachers**, they are doing a hard job.
- **Teachers** are part of various frameworks to which they **are dependent** (school organization, regulations by law, principal etc.)
- Only a **very few** research mathematicians **have an internal insight to the situation in classrooms**
- Only **part of the teachers' work** in a **classroom is devoted to teaching mathematics**
- Europe is showing **significant differences** with respect to
  - The role of teachers in society
  - The qualification standards through the education
  - Salaries
  - Cultural longer traditions

# The role of curriculum

We have learnt through TIMSS (1997) that we have to distinguish between

- an **intended** curriculum
- an **implemented** curriculum and finally last not least
- the **assessed** curriculum.

In our discussions only the intended curriculum is our focus; the intended curriculum is just a printed document known to ministries and teachers (and the public)

# Historical facts

It would be interesting to have an **inventory on curriculum changes** and their **impacts in different countries** in the past. Not too much is known on the international level, however we know and one would be able to provide some insights from Germany, however this is only one country and elsewhere it might be as in Germany, but quite different

You should know, **good intended curriculum may fail**

- E.g., the problem solving orientated curriculum in the States in the 70ies

There is a lot of literature on this fact...

# Will there be ever an optimal curriculum in mathematics?

- Continuous changes of curricula are necessary, but it is **misunderstanding** that we through decades have a **convergence process** leading finally to an optimal curriculum. **We will not win the struggle, but there are many cases where we might loose the battle!**
- To use a metaphor: Curriculum are like apartment buildings which should be open **for continuous changes** depending on the actual use; thus do not use brick wall to separate rooms, but just temporary room dividers...
- Curriculum is a **necessary** and **an important factor**, but by no means it is the single factor to influence mathematics teaching.

# Institutional surround and the need for coherence

**Systemic incoherence is the death knell of professional development.** Specifically, there is evidence that there can be significant progress within a school district when:

- There is a set of high standards (here you need cooperation with mathematicians)
- Curriculum is aligned with those standards
- Assessment is aligned with those standards
- Professional development is aligned with those standards
- There is enough stability for growth and change to take place.

If any of these are lacking, the chances for progress are significantly diminished.