Actions to Improve Learning Outcomes in Germany

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The ‘PISA-Schock’

- Achievement in reading, science, and mathematics below OECD average
- High effects of socio-economic status
- High percentage of students at risk in reading (≈ 20% at or below level 1)
- Low percentage of high achievers

Germany has one of the world’s most effective, fair and efficient school systems (OECD, 2011).
The PISA trend

Germany – Once weak international standing prompts strong nationwide reforms for rapid improvement (OECD, 2011)

(Source: OECD)
The PISA trend

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The Positive Change

For the first time, large scale change was possible (OECD, 2011).

The German Education Reforms:

1. School structure
2. Language problems
3. Transparency/Accountability
4. School hours
5. School autonomy
6. Teacher quality
The Positive Change

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The Positive Change

School Structure

• Reducing the influence of socio-economic background on achievement by
  – Reducing the «social» selectivity at the transition to secondary school (at age 10!)
  – Structural changes in school systems:
    • Combining different types of schools (e.g., Gymnasium, Gesamtschule)
    • Changing the transition to upper secondary level

PISA informs us about the problems in the educational system (Klieme, 2010). (OECD, 2011)
The Positive Change

Language Problems

- Organized, high quality, and affordable language trainings for children
  - Focus on poor, minority, immigrant children
  - ‘Kindergarten’ level (preschool)
  - Legislation to attend Kindergarten (age ≥ 3)
  - Educational contents in preschool programs (e.g., language, writing, maths, science)

(OECD, 2011)
The Positive Change

Transparency/Accountability

• Using different monitoring systems:
  – Participation in international large-scale assessments (PIRLS, PISA, TIMSS)
  – Comparative national assessments across the 16 federal states
  – Additional assessments within the federal states

• Developing performance standards

(OECD, 2011)
The Positive Change

Transparency/Accountability

Introduction of statewide (national) standards

- Competence requirements as goals at specific time points
- Subject-specific and related to core areas
- Theory-driven competence models and assessments

→ Alignment of standards, assessments, research

(Source: dipf.de)

(Klieme & Maag Merki, 2008)
The Positive Change

Transparency/Accountability

Introduction of statewide (national) standards

Levels

Competence areas

- Use of content knowledge
- Scientific inquiry
- Communication
- Evaluation & argumentation

Students…

- develop scientific research questions to be answered by experiments
- plan experiments to test hypotheses
- collect and interpret data from experiments

(KMK, 2005; Neumann, Fischer, & Kauertz, 2010)
The Positive Change

Teacher Quality

Establishing research on teacher education and instructional quality:

– Effects of teachers’ competencies, beliefs, and attitudes on student achievement
– Participation in international large-scale assessments (TALIS, TEDS-M)
– Teaching science in contexts (e.g., ChiKo, BiKo)

(Blömeke & Paine, 2008; Klusmann et al., 2008; Kunter et al., 2013)
More work to be done…

- Support high-achieving students
- Foster language competences
- Improve instructional quality
- Need for research on:
  - (Math/Science) Instruction and 21st century skills (e.g., problem solving)
  - Preschool education
  - Teachers’ professional development in science

Reforms need to evaluated based on theory.
The Positive Change

Lessons learned...

1. Change due to a number of factors and efforts
2. Different levels need to be taken into account (students at risk, teachers)
3. Systematic monitoring necessary
4. What works best in other countries, might not work somewhere else.
Thank you.

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Further information: http://www.uv.uio.no/cemo/english/conferences/Standard-setting2015/
# Appendix

## Germany’s education system organisation

<table>
<thead>
<tr>
<th>Grade</th>
<th>Age</th>
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*Hauptschule* students usually graduate after nine years.  
*Realschule* students graduate after ten years.

- Berufsschule (Apprenticeship combined work and classes)  
- Berufsfachschule (Vocational training)  
- Fachoberschule (Specialised high school)  
- Gymnasium

University and college preparatory classes in Gymnasium and some Gesamtschulen

### Orientation stage

- Grundschule  
  - Elementary school

- Kindergarten
Appendix

Transparency/Accountability

Introduction of statewide (national) standards

Complexity
- generic concept
- 2 relations
- 1 relation
- 2 facts
- 1 fact

Cognitive Processes
- Integration
- Organisation
- Selection
- Reproduction

Competence areas
- Use of content knowledge
- Scientific inquiry
- Communication
- Evaluation & argumentation

(Neumann, Fischer, & Kauertz, 2010)
Appendix

Introduction of statewide (national) standards

<table>
<thead>
<tr>
<th>Area of competency</th>
<th>Students will ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content knowledge</td>
<td>Possess a profound, well-structured knowledge based on the basic concepts.</td>
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<tr>
<td></td>
<td>Use analogies to solve tasks and problems.</td>
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<tr>
<td>Scientific inquiry</td>
<td>Formulate hypotheses at hand of ordinary examples.</td>
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<td>Plan, perform, and analyze ordinary experiments.</td>
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<td>Communication</td>
<td>Research a topic using different sources.</td>
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<td>Present results of their work in a way appropriate to the audience.</td>
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<td>Assessment</td>
<td>Compare and judge alternative technical solutions considering physical, economic, social, and ecological aspects.</td>
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<td>Name implications of physics-related findings with respect to historical and social contexts.</td>
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(Neumann, Fischer, & Kauertz, 2010, p. 556)
References


