

Prof. Dr. Manfred Prenzel
TUM School of Education

Methodologies of teacher assessment

IBE Research and Educational Policy Seminar Series
February 20th, 2012

Overview

- 1. The conventional teacher assessment**
2. Self-assessment for certain purposes
3. Teacher assessment in research projects
 - COACTIV
 - Video studies
4. Research aiming at instruments (Observe)

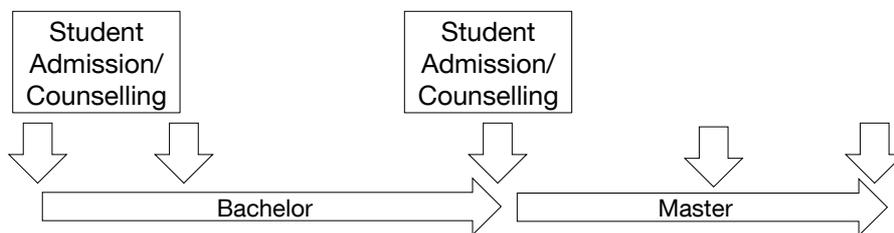
Teacher Education in Germany

- Is related to different school types/ levels
- Varies to some extent between the Federal States
- All teachers have to study at least two subjects (+ psychology and educational sciences)
- Three phases
 - Pre-service training at University (4-5 years), Degree: Master or “First State Examination”
 - Legal Traineeship “Referendariat” (2 years), “Second State Examination”
 - Continuing education (life long)
- Teachers normally are civil servants, and obliged to engage in continuing education

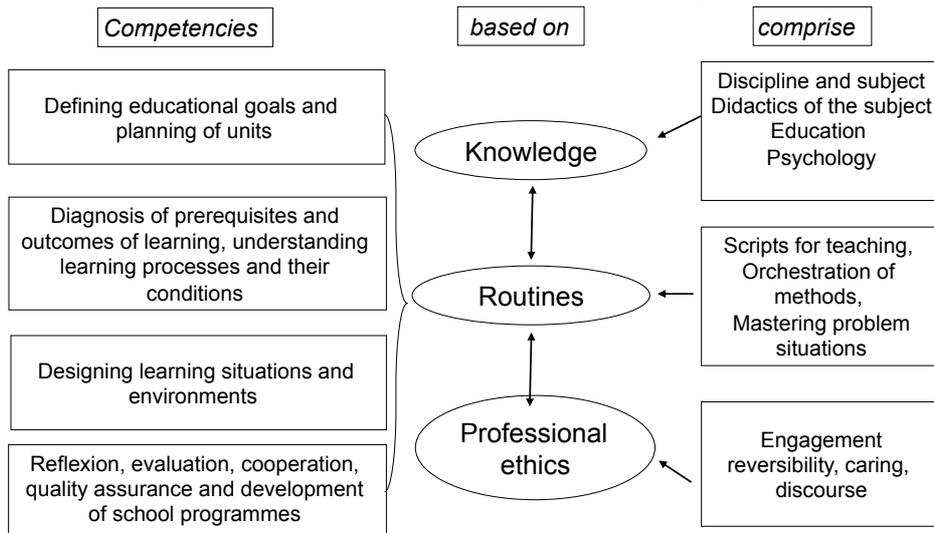
Usual teacher assessment in Germany

- Pre-service training/University: First of all tests, seminar & project papers, reports, bachelor’s thesis, central (State) examinations
- Legal Traineeship: Lesson plans, teaching behaviour, reflection, teaching projects, “Second State Examination” (sitting in on lectures)

TUM School of Education Goal-oriented mentoring and guidance



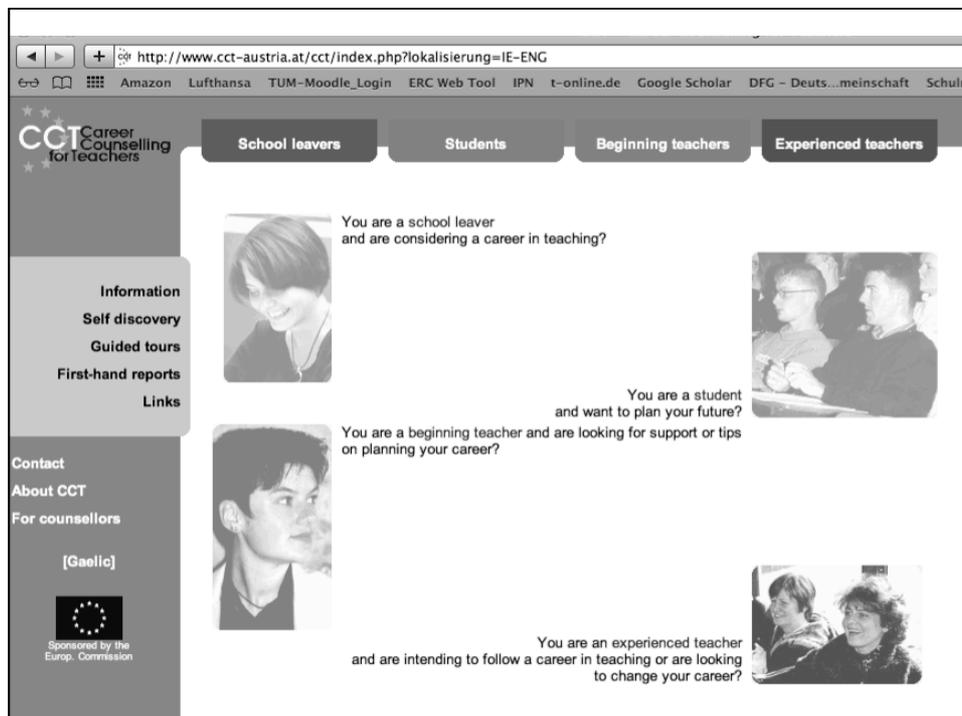
Components of teacher's competence



(vgl. z.B.: KMK-Perspektiven der Lehrerbildung)

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The screenshot shows the website for CCT Career Counselling for teachers. The browser address bar displays the URL: <http://www.cct-austria.at/cct/index.php?lokalisierung=IE-ENG>. The website features a navigation menu with four categories: School leavers, Students, Beginning teachers, and Experienced teachers. A sidebar on the left contains links for Information, Self discovery, Guided tours, First-hand reports, and Links. The main content area is divided into four sections, each with a small image and a question:

- School leavers:** You are a school leaver and are considering a career in teaching? (Image of a young woman smiling)
- Students:** You are a student and want to plan your future? (Image of two young men talking)
- Beginning teachers:** You are a beginning teacher and are looking for support or tips on planning your career? (Image of a young man looking thoughtful)
- Experienced teachers:** You are an experienced teacher and are intending to follow a career in teaching or are looking to change your career? (Image of two women talking)

The footer includes contact information, a link to 'About CCT', a language selector for '[Gaelic]', and a logo for the European Commission with the text 'Sponsored by the Europ. Commission'.

http://www.cct-austria.at/cct/index.php?lokalisierung=IE-ENG

Amazon Lufthansa TUM-Moodle_Login ERC Web Tool IPN t-online.de Google Scholar DFG - Deuts...meinschaft Schuln

CCT Career Counselling for teachers

School leavers Students Beginning teachers Experienced teachers

Self-discovery Interest-focused questionnaire - School leavers 

What teachers do: Does this sound intriguing to you?

Much of what teachers do is no secret to you - after all, for years you had the chance to observe teachers and their activities from the pupil's vantage point. However, many professional activities of teachers remain more or less invisible to pupils, or are only noticed when their attention is drawn to them.

Here is a random list of tasks characteristic of a teacher's job. You can use the list to round off your perception of this profession and to establish whether you are sufficiently interested in these activities. Subsequent evaluation will provide a detailed outline of these activities and your interest in them.

Imagine you are a teacher:

Would you like to do these tasks?

1. Explaining things to the pupils	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
2. Setting conflicts among pupils	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
3. Reading new publications dealing with your subjects	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
4. Giving a presentation of learning techniques during a parents' evening	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
5. Marking pupils' attainment	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
6. Integrating foreign children into the class	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
7. Assisting pupils working on their own	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like
8. Going on outings with pupils	<input type="radio"/> not like at all	<input type="radio"/> not really like	<input type="radio"/> not mind	<input type="radio"/> like	<input type="radio"/> would very much like

Information
Self discovery
Guided tours
First-hand reports
Links

Contact
About CCT
For counsellors

[Gaelic]


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Admin Area

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Technische Universität München 

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PISA 2003 leading to the COACTIV study: How much do students learn in mathematics over the course of one year of schooling?

In a national extension of
PISA 2003 students were
tested twice in Mathematics
and Science:
At the end of grade 9 and,
one year later, at the end of
grade 10



Prenzel et al. (2006)

“PISA-I-plus” in Germany

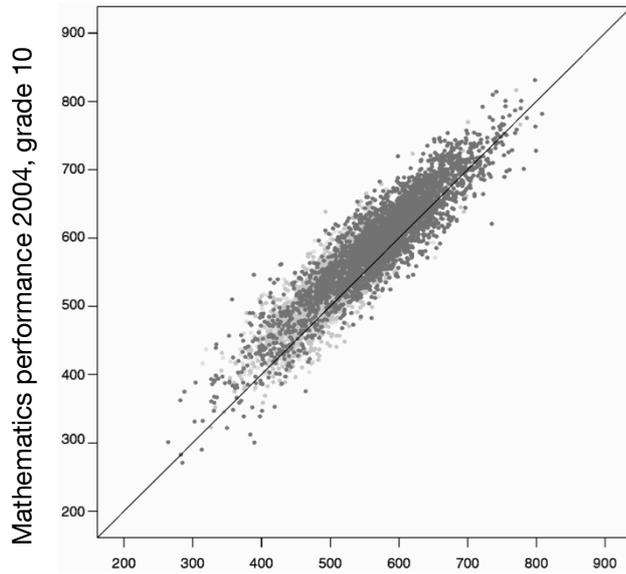
- Base: the international PISA school sample (n=198)
- + Two complete classes per school, grade 9 (2003)
 - + Additional (national) assessments (second day)
 - + Parent questionnaire
 - + Teacher questionnaire (Mathematics teachers)
 - + COACTIV: Assessment of the mathematics teachers in the selected classrooms
 - + Follow-up assessment (mathematics, science) in grade 10 (2004)



Mathematics performance at the end of grade 9 and grade 10
(individual level, latent growth)

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For **58 %** of the students a relevant gain in mathematics performance in the course of one school year was found – for **42 %** not!

Increase on average:
25 points
($d = .33$)

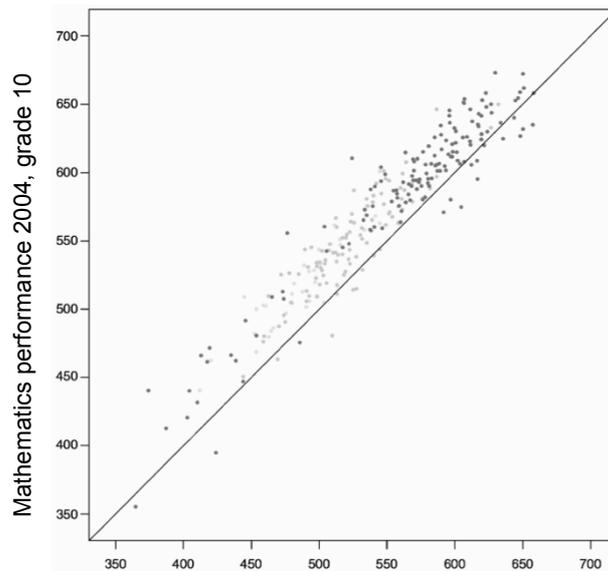
Mathematics performance 2003, grade 9



Mathematics performance at the end of grade 9 and grade 10
(classroom level, latent growth)

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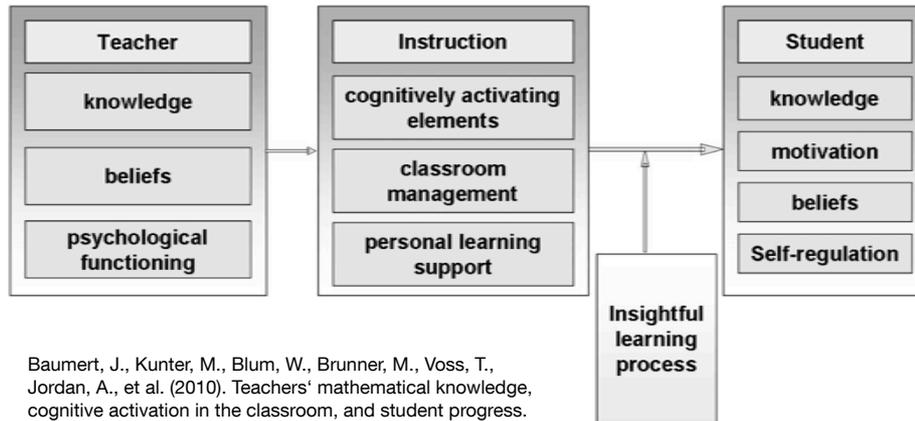
Technische Universität München 



A relevant gain in mathematics performance was found in **89 %** of the classes

Mathematics performance 2003, grade 9

The COACTIV framework



The COACTIV teacher assessment

- Pedagogical content knowledge (24 items, open ended)
- Mathematical (content) knowledge (13 items, open)
- Teacher's beliefs (self report): "transmission view", "constructivist view"
- Engagement (e.g. enthusiasm for mathematics, career ambitions, self-regulation, ability to cope)

Additional measures of aspects of instruction

- task analysis (homework assignments, exams, tasks used in introductory lessons) (national) assessments (second day)
- Student and teacher ratings of classroom events and behaviours

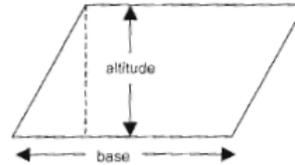
2a: "Square"
("Tasks" subfacet of **pedagogical content knowledge**)

How does the surface area of a square change when the side length is tripled? Show your reasoning.

Please note down as many different ways of solving this problem (and different reasonings) as possible.

2b: "Parallelogram"
("Students" subfacet of **pedagogical content knowledge**)

The area of a parallelogram can be calculated by multiplying the length of its base by its altitude.



Please sketch an example of a parallelogram to which students might fail to apply this formula.

Sample items of the knowledge assessment

2c: "-1 times -1"
("Instruction" subfacet of **pedagogical content knowledge**)

A student says: I don't understand why $(-1) \cdot (-1) = 1$

Please outline as many different ways as possible of explaining this mathematical fact to your student.

2d: "Infinite decimal"
(Test of **content knowledge**)

Is it true that $0.999999... = 1$?
Please give detailed reasons for your answer.

Instruction: Sample item

A student says:

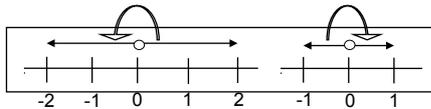
I don't understand, why $(-1) \cdot (-1) = 1$

Please try to help your student to understand that issues using as manifold ways as possible

- Instruction: Explaining, showing and representing mathematical issues

right

$$\begin{aligned}
 -1 \cdot 2 &= -2 \\
 -1 \cdot 1 &= -1 \\
 -1 \cdot 0 &= 0 \\
 -1 \cdot (-1) &= 1 \\
 -1 \cdot (-2) &= 2
 \end{aligned}$$



"To multiplying by -1 means to turn into contrary: z.B. loan into debt and vice versa. The contrary of -1 (Euro) is 1 (Euro) balance."

"You can illustrate $(-1) \cdot (-1)$ also as double negation"

wrong

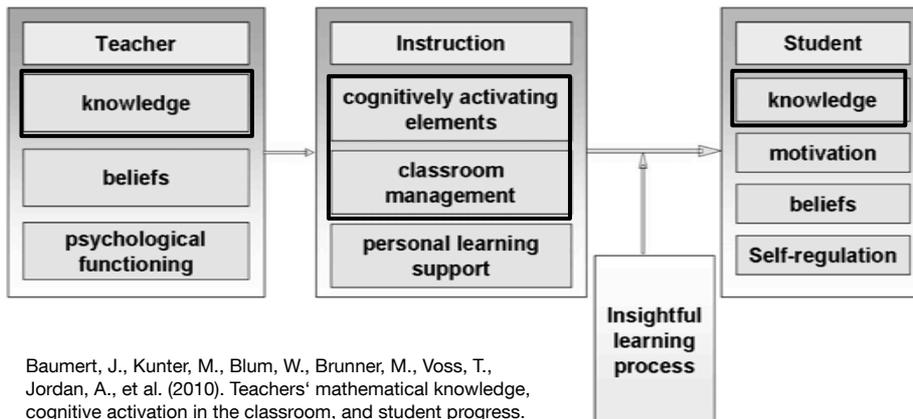
"That's as it is!"

"This is something that has to be learnt and used, and nothing what has to be explained"

"Look for mathematical definitions!"

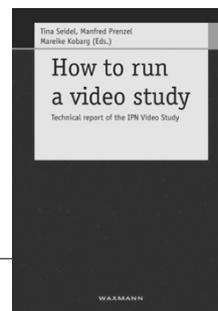
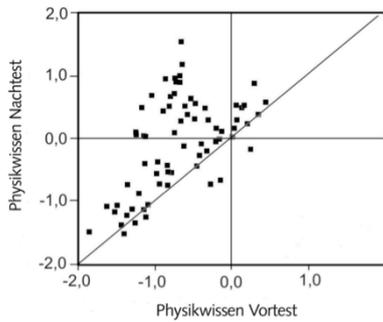
$$\begin{aligned}
 -1 &= -1 \\
 (-1) \cdot (-1) &= 1 \\
 (-1) \cdot (-1) \cdot (-1) &= -1 \\
 (-1) \cdot (-1) \cdot (-1) \cdot (-1) &= 1
 \end{aligned}$$

COACTIV findings



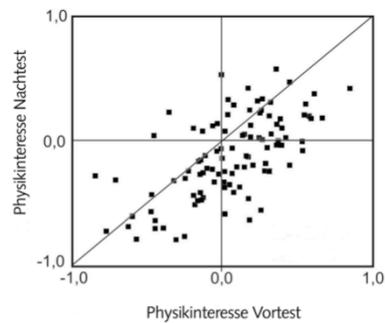
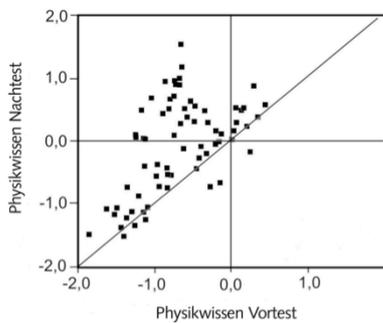
Baumert, J., Kunter, M., Blum, W., Brunner, M., Voss, T., Jordan, A., et al. (2010). Teachers' mathematical knowledge, cognitive activation in the classroom, and student progress. *American Educational Research Journal*, 47(1), 133–180.

What do students learn in Physics over the course of one year of schooling (in 50 classrooms)?



Seidel, Prenzel et al. (IPN-Video study)

How does the interest in Physics change during this year?



Seidel, Prenzel et al. (IPN-Videostudie)



Software *Videograph*: Rimmelé, 2002, 2004



Relevant factors

For example,

- Goal orientation
- Process-oriented teaching
- Inquiry-based science teaching



Assessing professional vision via videotaped classroom situations . . . (Project "Observe")



Darling-Hammond,
2006; Reusser 2005

Miller & Zhou 2007

Goldman 2007

- are situated and contextualized stimuli
- represent the complexity of „real“ classroom situations
- offer secondhand experiences of teaching

