Professional Development of Teachers: Which Role can Models and Theories play?

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Overview

- Why we need theories?
- Characteristics of PD courses
- Which theories we need?

Theories, models, results based on scientific evidence

How much freedom for the learners?

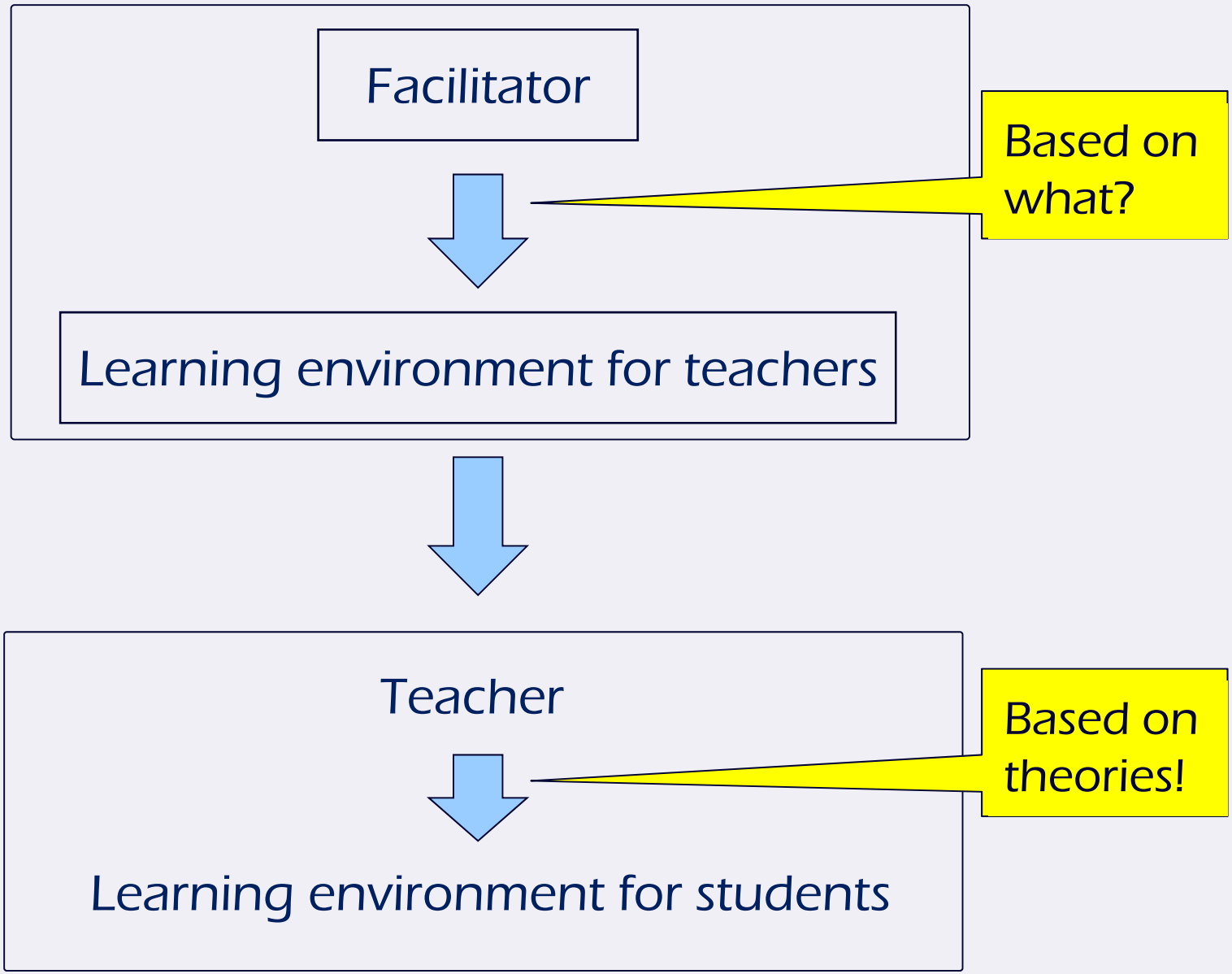
Why we need theories?

What characterizes a PD course or workshop?

- Organization of teaching-learning situations which gives (at least) teachers the opportunity to learn
- Learning goals (for teachers): knowledge acquisition, changing beliefs, increasing motivation...
- "Afterwards", teachers should be able to analyze or to prepare mathematics classroom based on mathematics educational theories

Theories, models, results based on scientific evidence

Reason 1:


Facilitator
Based on what?
Learning environment for teachers
Teacher
Based on theories!
Learning environment for students

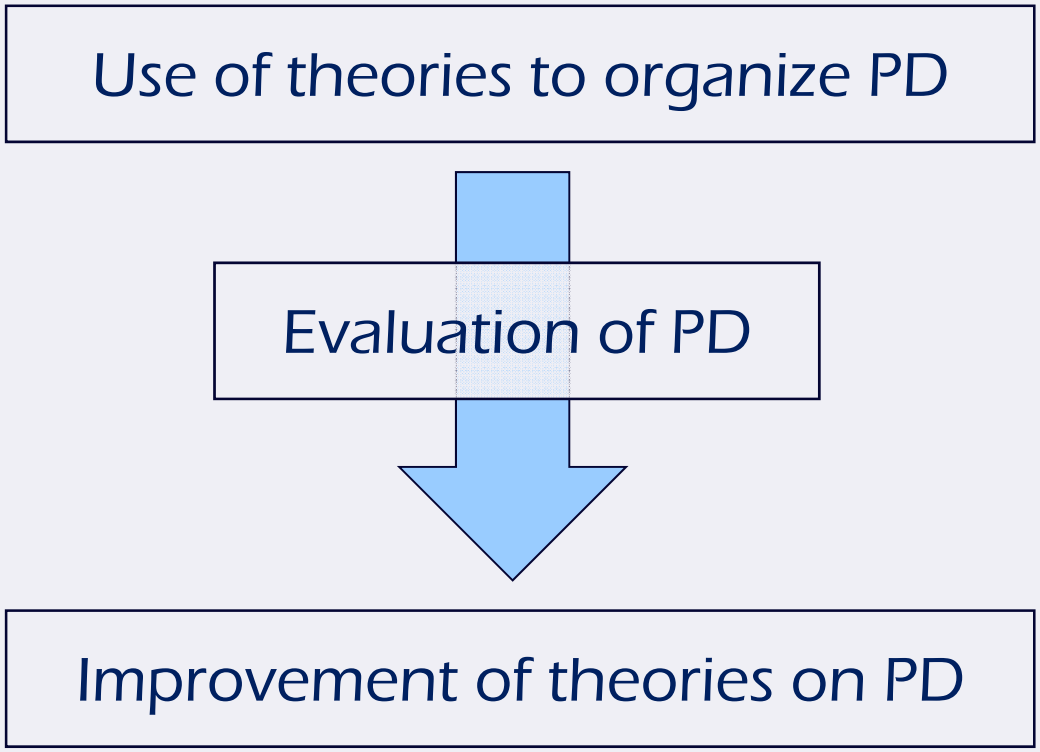
Why we need theories?

Reason 2:

- PD consists of teaching-learning situations
- Educational research provides many results about models or conditions for effective teaching-learning situations
- Use (adapt) these findings for organizing PD courses

Why we need theories?

Reason 3:



Why we need theories?

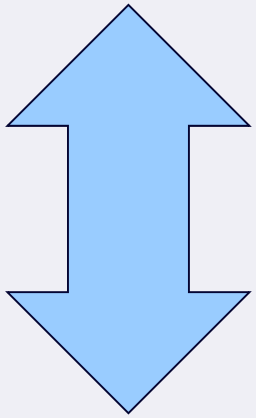
Levels of Evaluation

1. Acceptance of the training and the self-reported changes in teachers' thoughts and actions
2. Changes in teachers' cognitions about learning and instruction
3. Changes in teachers' competence of teaching and communication in the classroom
4. Effects on the students' learning outcomes

(cf. Kirkpatrick, 1979)

Characteristics of PD

Heteronomous learning



Autonomous learning

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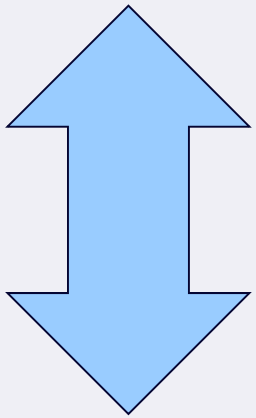
Characteristics of PD: Motivation

PD is obligatory for all teachers



Teachers can participate in PD

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Motivation

Teacher types

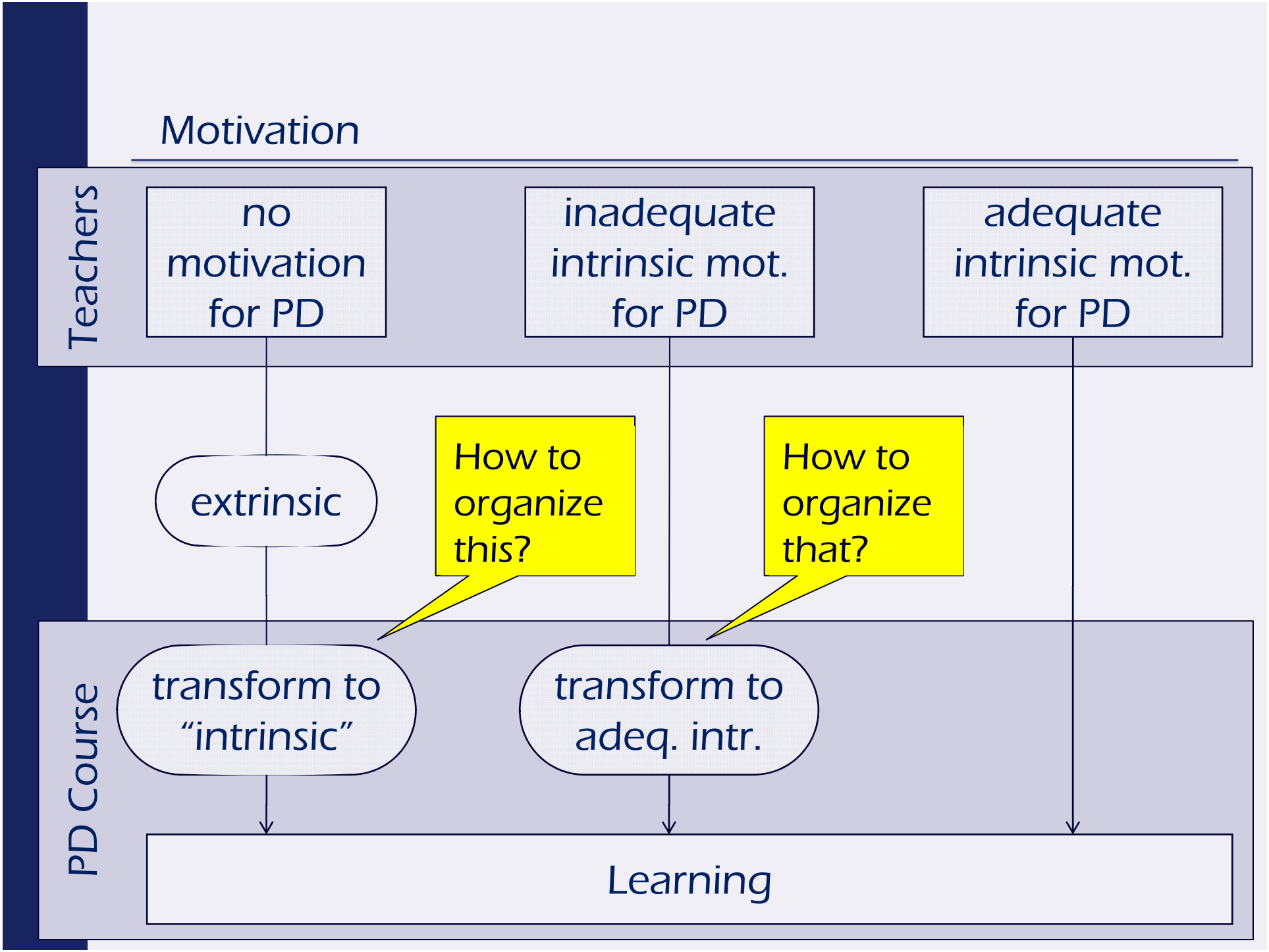
(John)

- Rational adapters
- Stone-age obstructionists
- Pragmatic sceptics

Teacher expectations

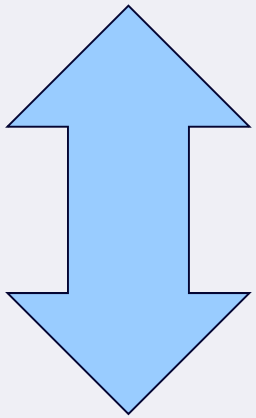
(Peter)

- Resist and reproach
- Remove and Replace
- Replace and Reorganize
- Rethink and Revamp
- Repeat and Renew
- Research and Revise


Motivation
Teachers
no motivation for PD
inadequate intrinsic mot. for PD
adequate intrinsic mot. for PD
extrinsic
How to organize this?
How to organize that?
PD Course
transform to "intrinsic"
transform to adeq. intr.
Learning

Characteristics of PD : Content

Normative approach based on models of classroom



Learner-focused approach based on interest of participating teachers

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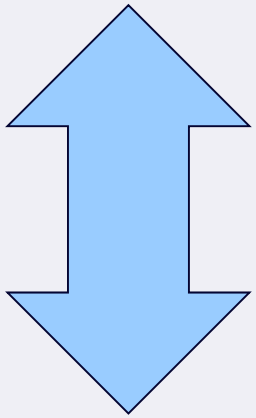
Characteristics of PD: Amount

Participating teachers should learn the prescribed content/curriculum of a PD course



Participating teachers learn as much as they think they need

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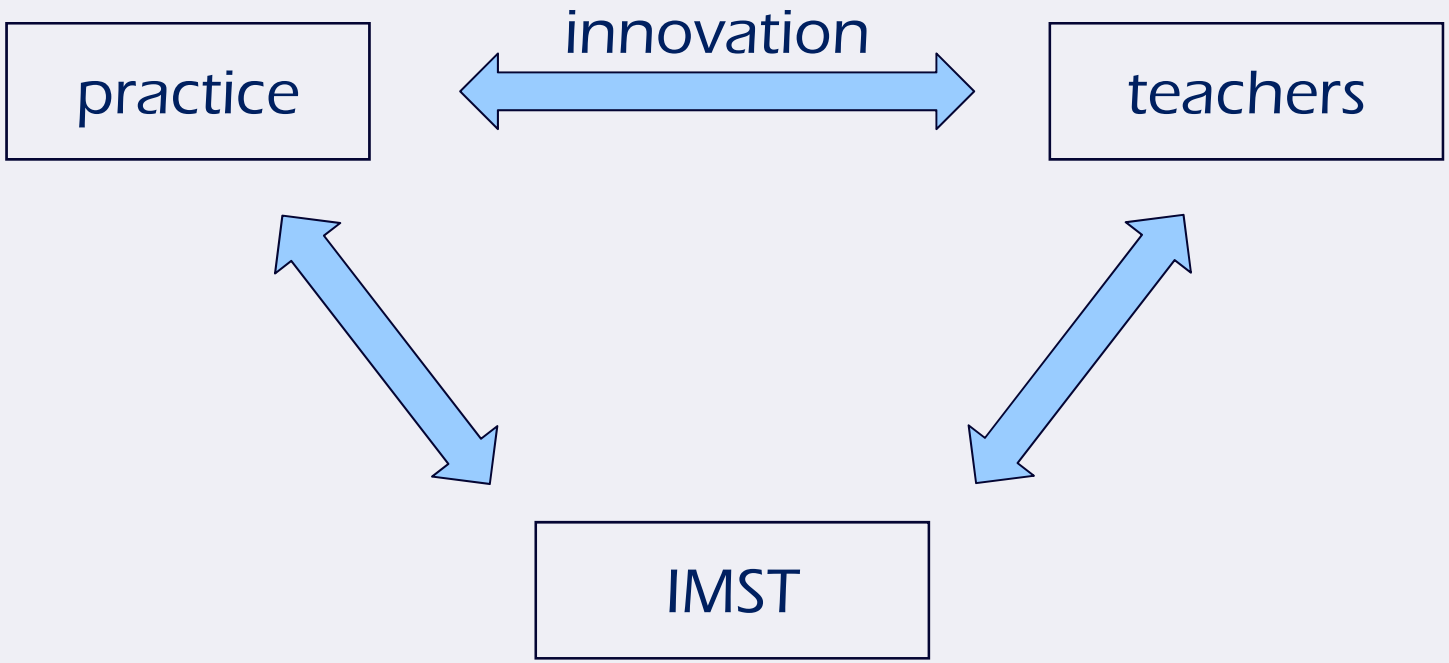
Teachers choose what & teachers decide how much

IMST (Konrad): reflective rationality



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Teachers choose what & teachers decide how much

Specific example:

Norway (Simon): collaborative research

Teacher-didactician collaboration to inquiry classroom practice

Restrictions on teachers choice and decisions

Normal case:

1. Teachers can choose a PD course
2. Content and amount of learning in this course is prescribed to a certain degree

Some examples:

- Teaching strategies (Olive)
- Diagnostic teaching (Alan)
- Mathematics done differently (Bettina, Jürg, Günter)
- ...

Amount & content: theoretical perspective

Can it really be helpful that a learner decides what and how much she/he learns?

What are conditions (content, organization etc.) for PD courses/programs so that a teacher decision on the content and amount is more effective than a prescription of content and amount?

- Afternoon PD workshop on fractions?
- Two-year PD program on PCK?

Which theories are helpful to analyze this?

- Cognitive perspective?
- Motivational perspective?

Which theories we need?

What characterizes a PD course or workshop?

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Which theories we need?

We need theories about

- Effective learning environments for teachers (e.g., in presentations of Kim, Stefan)
- Teacher competence (knowledge, beliefs, motivation,...)
- Effective mathematics classroom

Which theories we need?

Example: Diagnostic teaching (Alan)

1. Teacher competence:

   Teacher's in-the-moment-decision making as a function of teacher's knowledge, goals, beliefs

2. Effective mathematics classroom:

Diagnostic teaching
Involving students in activities
Classroom management

← has to be improved

Which theories we need?

Diagnostic teaching (Alan)

3. Effective learning environments for teachers:

   How to improve diagnostic teaching abilities?

   → Linking of KGB with diagnostic teaching

   → Addressing corresponding aspects of KGB to improve diagnostic teaching ability

Which theories we need?

More examples

- John: Learning cycle → effective learning environment
- Olive: teaching strategies → effective math classroom
- Others: CK, PCK → teacher competence

Message

Theories, models, results based on scientific evidence

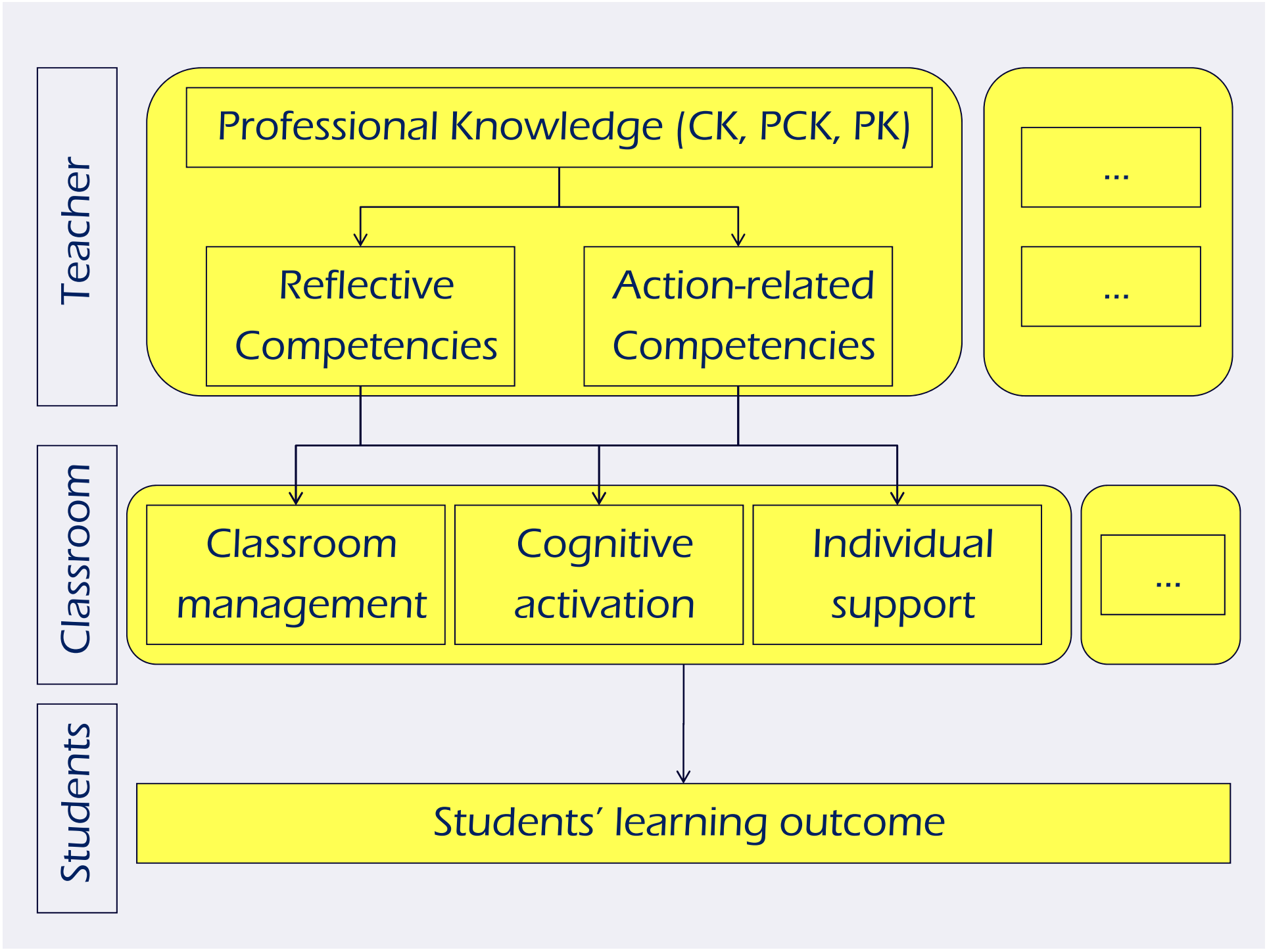
A link of

- research-based theories of
  - –mathematics teacher competencies
  - –effective mathematics classroom
  - –effective learning environments for teachers

with the

- development of learning environments for PD

should result in effective teacher professional development courses/programs.


Teacher
Professional Knowledge (CK, PCK, PK)
Reflective Competencies
Action-related Competencies
...
...
Classroom
Classroom management
Cognitive activation
Individual support
...
Students
Students' learning outcome