Content of this presentation

- Data use in 5 EU countries: England, Germany, Poland, Lithuania and the Netherlands

- Professional development in the use of data: the data team procedure
Importance of DBDM

- Making high quality decisions based on data
- Using data to determine learning needs of students and adapt instruction accordingly
- Data use for both teacher and student learning
- It can lead to increased student achievement (Campbell & Levin, 2009, Carlson, Borman, & Robinson, 2011; McNaughton, Lai, & Hsiao, 2012)

Data use theory of action

(Schildkamp & Poortman (in press))
Data use in five EU countries

- What data are used by schools in different countries?
- For which purposes do school leaders and teachers use data in these countries?
- Which organizational, data and data systems, and user characteristics influence the use of data?
- Method: 16 best practice schools, 86 interviews, and document analysis

Results: Data and data systems

- England: The widest range of data and data systems, focus on achievement data (e.g. value added data)
- Netherlands: More focussed on process data, lack of data systems
- Germany: No systematic data collection
- Poland: Focus on assessment data, lack of data systems
- Lithuania: Respondents mentioned less data sources, lack of data systems

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**Results: Data use for instruction**

- Monitoring progress: all five countries
- Instructional changes: mostly in the UK, to some extent in GE, PO and NL
- Curriculum development: mostly in the UK
- Rewarding and motivating students: UK

**Influencing characteristics**

- School organizational characteristics
  - Collaboration: UK and LT
  - Data expert on site: UK and NL
  - Vision and goals: UK
  - Professional development: UK
- Data and data system characteristics
  - Systems and tools: UK
- User characteristics
  - Attitude: all five countries
  - Knowledge and skills: UK and PO
Conclusion and discussion

- Widest range of data sources in the UK. However, narrow focus on output data may lead to a narrow form of data-based decision making focused only on cognitive outcomes.
- Data use for instruction in most countries did not move beyond the monitoring phase, with the exception of the UK.
- Lack of data use for instruction. But: link between data use and increased student achievement goes through using data for instruction.
- In UK important enablers are present: collaboration, data expert on site, access to a wide range of data and (longitudinal data) systems, and professional development in the use of data.

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Professional development in data use is needed

- Lack of data use in education
- How we often solve our problems:
Professional development in data use: datateams

- Teams of 6-8 teachers and school leaders
- Work on a problem: e.g. grade repetition, low student achievement
- Following the eight steps DATATEAM® method
- University provides support
- 12-14 meetings per year

Step 1: Problem definition

- Identify a current problem in the school:
  - School-wide
  - Subject-specific
- Prove that you have a problem:
  - Collect data on current and desired situation (i.e. goal)
  - Preferably 3 cohorts
- Example: For the last three years on average 45% of our students was failing math in grade 2. Next year no more than 30% of our students is failing math in grade 2, the year after that no more than 15%
Step 2: Formulating hypotheses

- Two types:
  - Exploring: for which group (e.g. boys or girls) does this problem exist? The main aim of this type is to further specify and narrow down the problem
  - Explaining: possible causes of the problem

- Measurable, specific, and plausible

- Example: In the subject of math in year 1 and 2, students score significantly lower on “percentage” assignments than they do on other assignments.

Step 3: Data collection

- Available data

- Existing instruments

- Quantitative and qualitative

- Input, output and process data

- Examples: assessments with regard to different math’s assignments, such as percentages, measurement, narrative assignments
Step 4: Data quality check

- Reliability and validity of the data
- Several problems encountered with data, even with data from data systems
- Example: poor quality of assessments

Step 5: Data analysis

- Quantitative
  - Basic (e.g. averages and standard deviation)
  - More complex (e.g. t-test, correlation)
- Qualitative
  - E.g. Coding, summarizing
- Example: T-test to determine whether the underperforming students score significantly lower on percentage assignments
**Step 6: Interpretation and conclusions**

- From data to information to knowledge
- Is our hypothesis rejected or confirmed
  - Rejected: go back to step 2
  - Confirmed: continue with step 7
- **Example:** t-test confirms that underperforming students score significantly lower on percentages

**Step 7: Implementing improvement measures**

- Designing solutions for the problem based on the confirmed cause of the problem
  - Use of experience and other resources
- **Example:** Additional practice percentages in the form of a quiz for underperforming students, while the other students are working independently
Step 8: Evaluation

- **Process evaluation:**
  Are the measures implemented:
  - By everyone?
  - As intended?
  - **Example:** not all math’s teachers conduct the quiz?

- **Effect evaluation:**
  - Has the problem been solved: did we reach our goal as stated in step 1?
  - **Example:** The results of the end of the year show that less students are underperforming in math (from 45% to 28%).

Our research

- Started with a small pilot in 2009: 4 schools

- Growing: currently 37 schools in our project, but also schools outside the project

- Research focussing on: functioning, influencing factors, knowledge creation and sharing, social networks, effects and sustainability
Method

- This presentation focuses on:
- Observations, trainer logs, and interviews in 4 case study schools
- Data use satisfaction survey (post-test) in 9 data team schools
- Knowledge test (pre-test and post-test) in 9 data team schools
- Data use survey (pre-test and post-test) in 9 data team schools and 42 control group schools

Results: Data team functioning

Depth of inquiry

Attribution
Results: influencing factors

- Leadership: facilitation, motivation, new perspective, role model
- Collaboration and trust (inside and outside the data team)
- Shared problem and goals (e.g. ownership)
- Structured eight step procedure
- Access to high quality data, availability of multiple sources of data, and availability of data systems
- External support
- Knowledge and skills: data literacy, PCK and school organizational knowledge

Results: Teacher satisfaction

- Satisfied to very satisfied about support (m=4.50) and materials (M=4.14).

- Neutral to satisfied about completing the steps (m=3.88) and the process in the data team (m=3.96).

- “It’s is very valuable; it’s good to have the steps on paper”.
Results: Teacher learning results

- Data team members scored significantly higher on the assessment literacy posttest \( (m=10.4) \) than on the pretest \( (m=9.4, d=0.32) \).

- Gain scores on knowledge and skills on the data use questionnaire significantly higher for data team schools \( (m=0.10) \) than for control group schools \( (m=-0.06, d=0.62) \).

- “To talk about education with colleagues in the data team, and develop new insights (…) into why we do things”.

Results: Teacher use of knowledge and skills

- Gain scores on collaboration on the data use questionnaire significantly higher for data team schools \( (m=0.13) \) than for control group schools \( (m=-0.02, d=0.52) \).

- Gain scores on data use for accountability and data use for school development on the data use questionnaire higher for data team schools than for control group schools, but not significant.

- “I use data with my colleagues from the same department’, ‘but also with my group of students’; (…) we used to be talking ‘on an island’: now we will also share our findings with colleagues”.

Results: Effects on student achievement

- School level improvement:
  - Decrease in grade repetition

- Classroom level improvement:
  - Increased mathematic achievement in lower grades of secondary education
  - Increased final examination results for English

Conclusions and discussion

- Data team procedure promising professional development intervention.

- From intuition to data.

- Essential to start with a problem, not with data.

- Several conditions need to be in place to ensure the effectiveness of data related professional development, such as collaboration, access to high quality data, and support of the school leader.

- Further research is needed into the effects and sustainability of this type of data-related professional development.
Thank you for your attention

This presentation was based on the following publications:

• Schildkamp, K., & Poortman, C.L. (in press). Factors influencing the functioning of data teams. Teachers College Record.

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