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Education data, policy and practice

OECD meeting Tallinn 2015: Education governance: The role of data

Kim Schildkamp, University of Twente, K.Schildkamp@utwente.nl

Content of this presentation

- Data-based decision making
  - Definition
  - Importance
  - Use of data
- Challenges in the use of data at policy level, school level and teacher level
- Support in the use of data
  - An example from practice: the datateam® procedure

Data-based decision making (DBDM)

- The use of data, such as assessment results, to improve education (Schildkamp & Kuiper, 2010)
  - Systematically
  - Analyze and interpret data
  - Use this information to improve education

- Quantitative data and qualitative data
- Examples of data: demographic data, classroom observations, student surveys, parent interviews, assessment results

Importance of DBDM

- Gut feeling and instinct not always correct
- Making high quality decisions based on data
- Using data to determine learning needs of students and adapt instruction accordingly
- Check if goals are being reached

- It can lead to increased student achievement (Campbell & Levin, 2009, Carlson, Borman, & Robinson, 2011; McNaughton, Lai, & Hsiao, 2012)

Use of data

- Accountability: e.g., document how to school is doing for the inspectorate, for parents

- School improvement:
  - School development: e.g., policy development, teacher development, grouping of students
  - Instruction: e.g., set learning goals, differentiate, provide feedback

Challenges at policy level

- Ensuring access to data and data systems
- Data use as a balancing act:
  - Amount of pressure (e.g., high stakes testing, sanctions)
  - Amount of support (e.g., data systems, training)
  - Amount of autonomy (e.g., centralized or decentralized)
  - Accountability – school improvement (e.g., tension can lead to strategic use, misuse, and abuse)
- Important discussion: Who is accountable? To whom? For what? In what manner? Under what circumstances? Different in different countries

Challenges at the level of the school

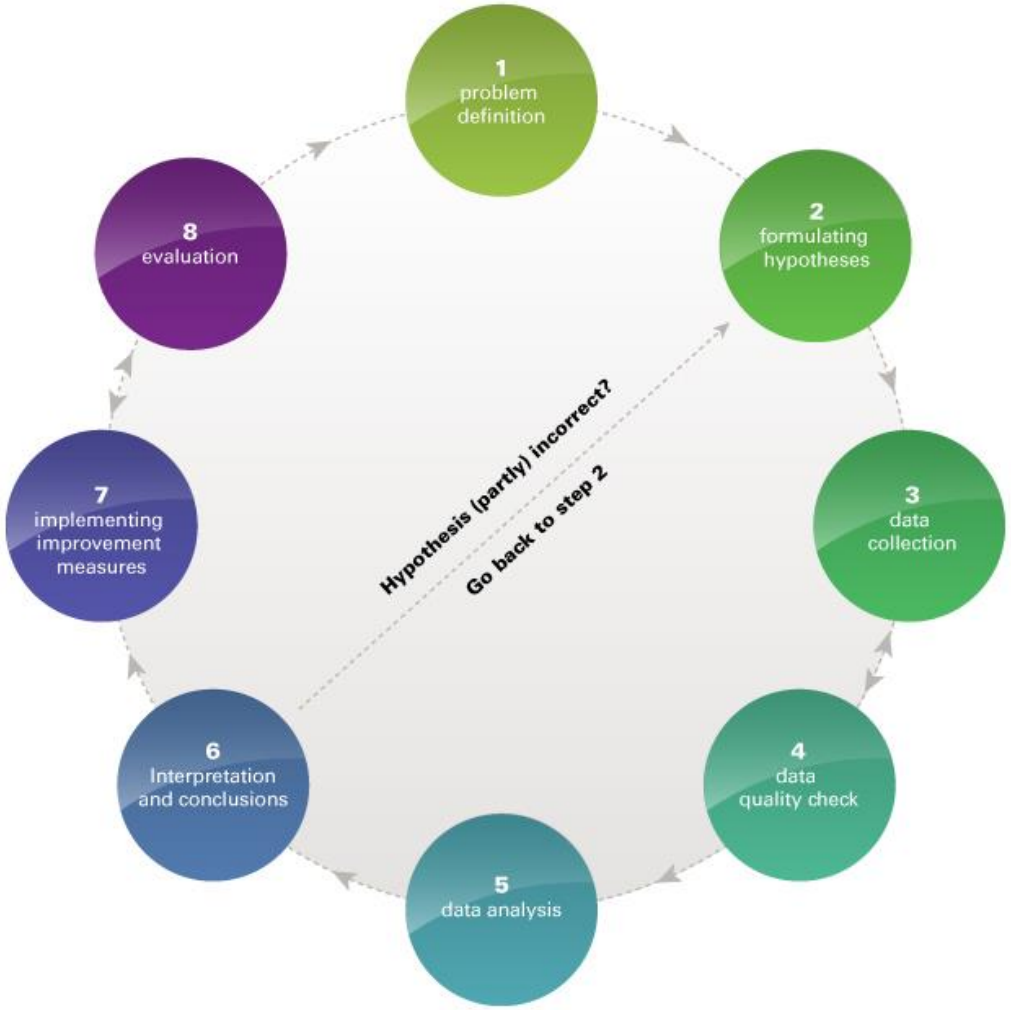
- Lack of collaboration around the use of data
  - Between school leaders and teachers
  - Between teachers
- Lack of expertise, for example, a data expert
- Lack of a data use culture (e.g., vision, norms, goals)
- Lack of school leader support in the use of data (e.g., facilitation, role model, distributed leadership)
- Lack of training and professional development in the use of data systems and in the use of data
- Lack of time (or lack of priority?)

Challenges at the level of the teacher

- Negative attitude: “I don’t belief in the use of data”
- Social pressure: Data use done to the school
- Lack of ownership over data and student learning
- Lack of perceived behavioral control: lack of autonomy, and/or “my measures will not influence student learning”
- Lack of collaboration: analysing and discussing data
- Difficulties in goal setting: establishing clear, measurable, individual student learning goals
- Lack of knowledge and skills how to improve education and solve educational problems (PD needed needed)

How problems often are solved

An example from practice: Datateam® procedure



- Teams 6-8 teachers and school leaders
- Educational problem: grade repetition, low student achievement
- Goals: professional development and school improvement
- Trainer guides them through the eight steps (two years)
- Data analysis courses

From small pilot to internationally implemented

- 2009: small pilot with 5 schools from one school board
- 2011: from regional to national
  - 24 schools (school board, ministry and school funded), 1 teacher training college
- 2013: national and international
  - 10 schools from one school board in the Netherlands, and 4 schools in Sweden
- 2014: further upscaling
  - 7 primary education schools, 4 schools in Sweden, and first school in England
- 2015: higher vocational education and other countries?

Step 1: Problem definition

- Identify a current problem in the school
  - School-wide or subject-specific
- Proof that you have a problem
  - Collect data on current situation and desired situation
  - Three cohorts/years
- Example:
  - Current situation: ‘45% of our students is failing math’
  - Desired situation: ‘Next year no more than 30% of our students is failing, the year after that no more than 15%.’

Step 2: Formulating hypotheses

- What are possible causes of the problem?
- Make it measurable!

- Examples:
  - Students that graduated on time have a significantly lower number of missed classes than students that did not graduate on time.
  - Students that fail the 4th year have significantly fewer study skills than students that pass the 4th year.
  - 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

- Examples:
  - Student achievement data
  - Surveys: motivation, feedback, curriculum coherence
  - Classroom observations
  - Student interviews, teacher interviews

Step 4: Data quality check

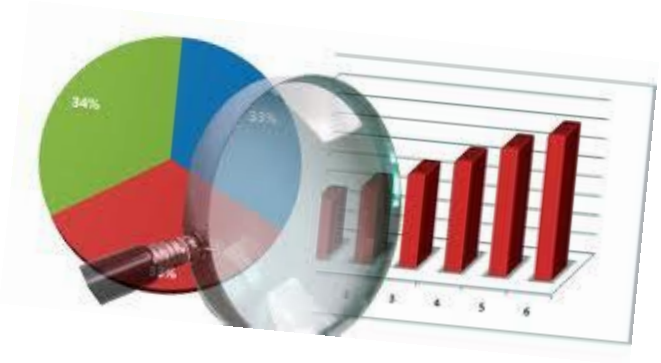
- Reliability and validity of the data
- Crucial step: not all available data are reliable and/or valid!

- Examples:
  - Validity problems with survey
  - Missing data
  - Data of one year only

Step 5: Data analysis

- Qualitative and quantitative
- From simple to complex
- Extra support needed: course data analysis

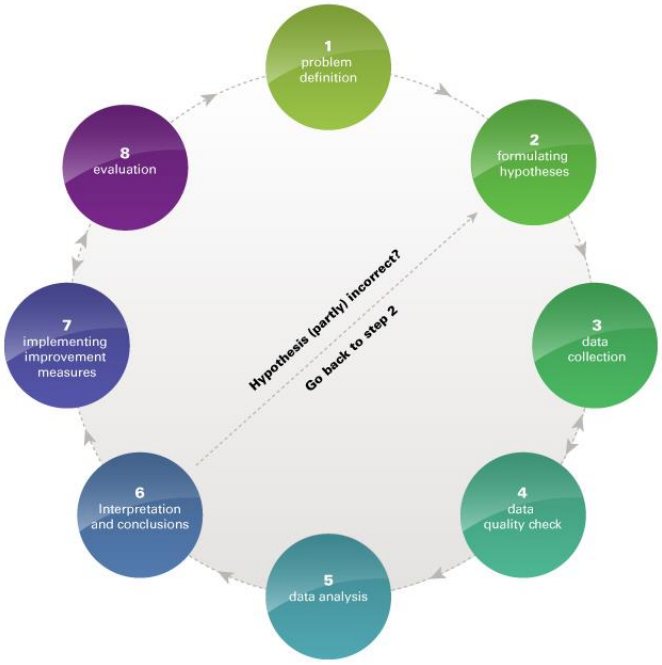
- Examples:
  - Average, standard deviation
  - Percentages
  - Comparing two groups: t-test
  - Qualitative analyses of interviews and observations



Step 6: Interpretation and conclusions

- Is our hypothesis rejected or confirmed?
  - Rejected: go back/ further to step 2
  - Accepted: continue with step 7

- 32 data teams (2012-2014):
  - 33 hypotheses: accepted
  - 45 hypotheses: rejected
  - 13 (qualitative) research questions
  - 13 hypotheses: no conclusion
  - due to limitations of the dataset



Step 7: Implementing measures

- Develop an action plan:
  - Smart goals
  - Task division and deadlines
  - Means
- Monitoring progress: how, who, which data?

- Examples:
  - Action plan feedback in the classroom
  - Curriculum development teams
  - Counselling/mentoring of students
  - Repetition of percentages in the classroom

Step 8: Evaluation (process)

- Process evaluation
  - Are the measures implemented the way we want?
  - Are the measures implemented by everyone?

- Example process evaluation:
  - Measure: start every lesson with a short repetition of percentages in the form of a quiz to increase mathematic achievement
  - Interview students: this is boring, start to detest percentages!
  - Adjust measures: repeat percentages only once a week

Step 8: Evaluation (effect)

- Effect evaluation:
  - Is the problem solved?
  - Did we reach our goal as stated in step 1?

- Example effect evaluation:
  - Did our measure(s) results in increased mathematics achievement?

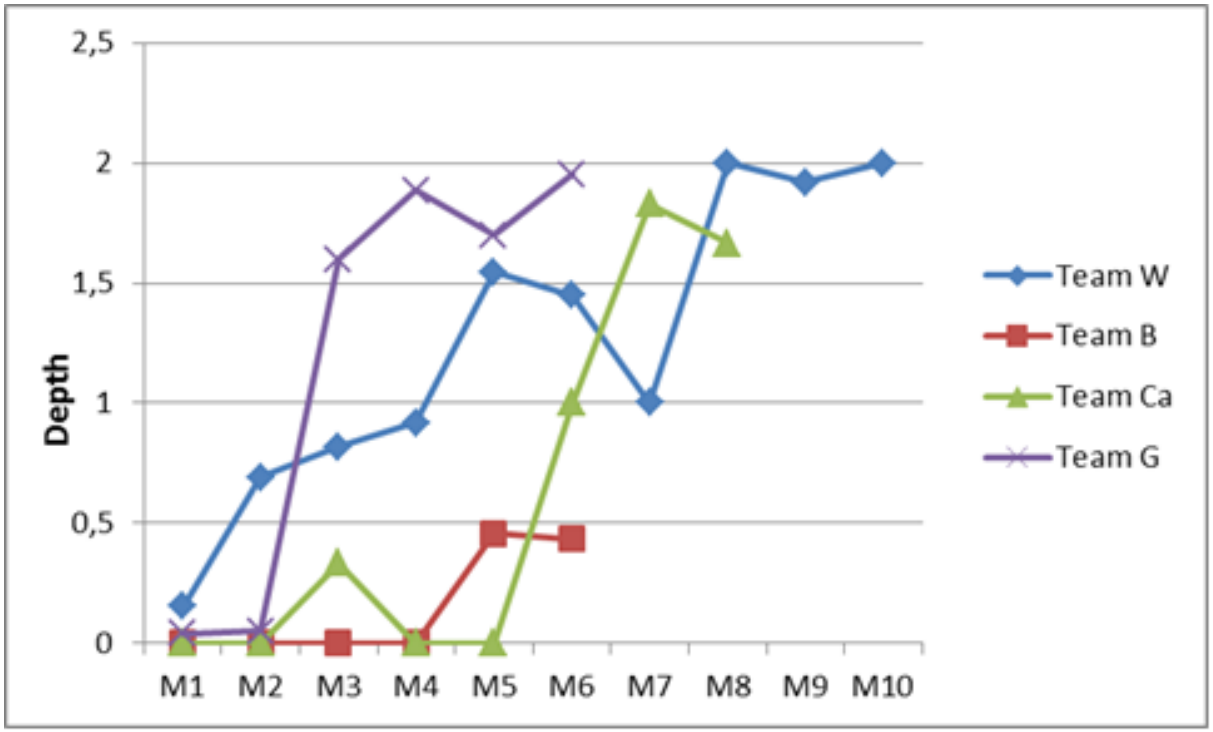
Research results

- How do data teams function?
- What are the influencing factors?
- What are the effects of data teams?

Data team functioning

- Difficult to make a measurable hypothesis
- Several rounds of hypotheses: first hypotheses always wrong
- Often external attribution: problem is caused by primary schools, by policy etc.
- However, this is necessary: need to create trust; practice with the eight step procedure; learning starts when you make mistakes; shows the importance of data
- From external to internal attribution

Functioning: depth of inquiry



- From intuition to data
- From knowledge to school improvement

Influencing factors

- Leadership: time, enthusiasm, role model, motivation, new perspective
- Collaboration and trust inside and outside the data team
- Voluntary participation
- Start with a shared problem and goal(s) (e.g., ownership)
- Access to high quality data (systems), availability of multiple sources of data in your own school
- Structured eight step procedure
- Support from the university: training and coaching over a period of two years

Effects: teacher learning results

- Knowledge posttest: data team members scored significantly higher (M = 10.4) than pretest (M = 9.4; *d* = 0.32).

- Data use questionnaire: gain score for knowledge and skills significantly higher for data team members (M = 0.10) than control group teachers (M = -0.06; *d* = 0.62)

- Interviews: teachers learnt, for example, how to use data, e.g.,: *'to talk about education with colleagues in the data team, and develop new insights (…) into why we do things*.'

Effects: teacher use of knowledge and skills

Data use questionnaire:

- Gain scores 'collaboration' significantly higher for data team schools (M = 0.13) than control group (M = 0.02, *d* = 0.52).
- Gain scores 'data use for accountability' and 'data use for school improvement' higher for data team members, however, not significant.
- 'Don't know': significantly reduced for 'instruction' and 'school improvement'
- Interviews also show teachers using data, e.g.,:
  - *'I use data with my colleagues from the same department'; We used to be talking 'on an island': now we will also share our findings with colleagues; 'You want to take decisions based on assumptions, that is not the way we work here anymore'.*

Effects: student learning

- Some evidence that it can lead to student learning: increase in final examination results English, improved mathematic achievement, less grade repetition
- However, not all schools were able to use data independently and solve their educational problem (yet)

We know more about facts and numbers now

Our gut feeling is often wrong

It brings added value to the school

Taking a look at the impact of our teaching

Conclusion and discussion

- Data team procedure promising professional development intervention. It can lead to:
  - changes at the school level: cultural change
  - changes at teacher level: from intuition-based decision making to data-based decision making
  - changes at student level: increased student learning
- Using the datateam® procedure takes time, and the support needed is extensive:
  - sustainability ?
  - upscaling?

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THANK YOU FOR YOUR ATTENTION!

Kim Schildkamp: k.schildkamp@utwente.nl

"I'm making a decision! Stop confusing me with facts!"

References

This presentation was largely based on the following publications:

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