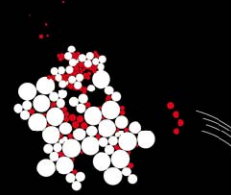


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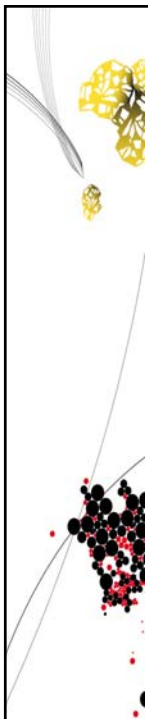


Data use for improving teaching and learning in schools: The data team professional development intervention



ResearchEd Amsterdam, 20-01-2018


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Content of this presentation

- Data-based decision making
- An intervention to support data use: The datateam intervention


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Data-based decision making (DBDM)

- The use of data, such as assessment results, to improve education (Schildkamp & Kuiper, 2010)
 - Systematically collect
 - 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

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Too many data: where to start?



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How problems often are solved



The datateam[®] procedure



- Teams 6-8 teachers and school leaders
- Educational problem: low student achievement, safety
- Goals: professional development and school improvement
- Coach guides them through the eight steps (1-2 years)
- Data analysis courses



Step 1: Problem definition

- Identify a current problem in the school
 - School-wide or subject-specific
- Prove 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 mathematics'
 - Desired situation: 'Next year no more than 30% of our students is failing, the year after that no more than 15%.'



Step 1 our problem definition

'We are not satisfied with the number of students repeating the fourth grade of secondary education. Over the last three years, on average 20% of our students had to repeat the fourth grade (N=135)

Next year, we want to achieve that no more than 15% of our students have to repeat the fourth grade, and the year after that this should be no more than 10%.'



Step 2: Formulating hypothesis

- Brainstorm possible causes
 - Ask colleagues for input
 - Make a list
- Choose a hypothesis
 - Based on criteria, such as: what can we influence as a school? Which hypothesis do a lot of colleagues believe to be true? What is according to the literature a possible cause?
- Formulate a hypothesis
 - Concrete
 - Measurable



Assignment step 2

- In groups of three
- You are working in a data team on the following problem:
'We are not satisfied with the number of students repeating the fourth grade of secondary education. Over the last three years, on average 20% of our students had to repeat the fourth grade (N=135). Next year, we want to achieve that no more than 15% of our students have to repeat the fourth grade, and the year after that this should be no more than 10%.'
- Discuss possible causes of this problem, and make a list of possible causes
- Choose one possible cause, and try to make it measurable



Step 2 our hypothesis

'Students who repeat the fourth grade are significantly less (at least one point on a five point scale) motivated than students who do not repeat the fourth grade.'



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





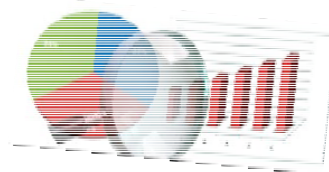
Step 4: Data quality check

- 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?



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?



Effects (NL)

Effects level	Instrument(s)
Level 1: satisfaction	<ul style="list-style-type: none">• Satisfied about support, process and progress• 'good'; 'fun'
Level 2: knowledge, skills, attitudes	<ul style="list-style-type: none">• Knowledge and skills increased significantly• 'learnt how to use calculations in Excel'; what + how of qualitative analysis; 'you really need evidence'
Level 3: use of learning	<ul style="list-style-type: none">• Data use for instruction: e.g., prepare students better for exam (explanation and practice)
Level 4: student achievement	<ul style="list-style-type: none">• Five out of nine schools solved problem: Significant increase in student achievement

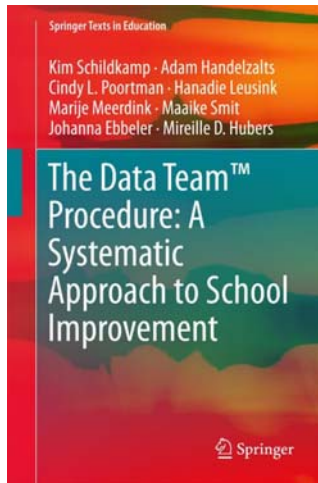


Conclusion and discussion

- Data teams: From 'intuition-based decision making' to 'data-based decision making'
- Change in school culture: "You want to take decisions based on assumptions, that is not the way we work here anymore"
- Support schools in solving problems and achieving goals
- Importance of knowledge sharing within and outside the team
- Need to invest in sustainability from the start: Data use as an organizational routine
- Increased student learning



More information



- Our website:
<https://www.utwente.nl/en/bms/elan/datateams/>
- A book, describing each step, including several examples:
<http://www.springer.com/us/book/9783319588520>
- For research papers:
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ANY QUESTIONS?
THANK YOU FOR YOUR ATTENTION!

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



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