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**Data use for school improvement:  
Achievement, equity and wellbeing**

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Build bridges between data (collection, science) and data use (e.g., by teachers, school leaders), between technology and human capacity; to inspire, innovate and accelerate the use of data for learning and development in our society

Data science   Data use   Technology   Capacity   Learning

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## In this presentation

Three key take away messages:

1. Data use should start with a clear purpose (e.g., achievement, but also equity, wellbeing)
2. To achieve goals of e.g., equity in “schüler in sozial deprivierten kontexten” more data are needed than just achievement data
3. Effective data use requires a collective effort

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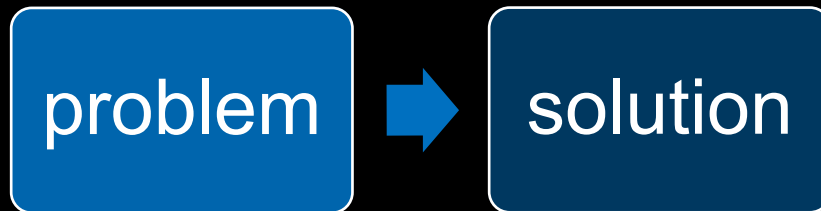


## Introduction

- In today's society, enormous volumes of data are available to help inform decision making. Data: 'the new gold'?
- New tools and applications, such as dashboards, machine learning, and Artificial Intelligence (AI), are developed constantly.
- Key challenge: How to use data and “digitaler technologien” to improve the quality of human decision making, including the implementation and evaluation of these decisions in the complex context of education?

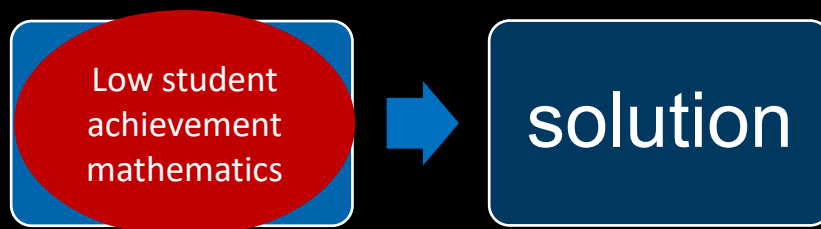
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### Data use for quality improvement



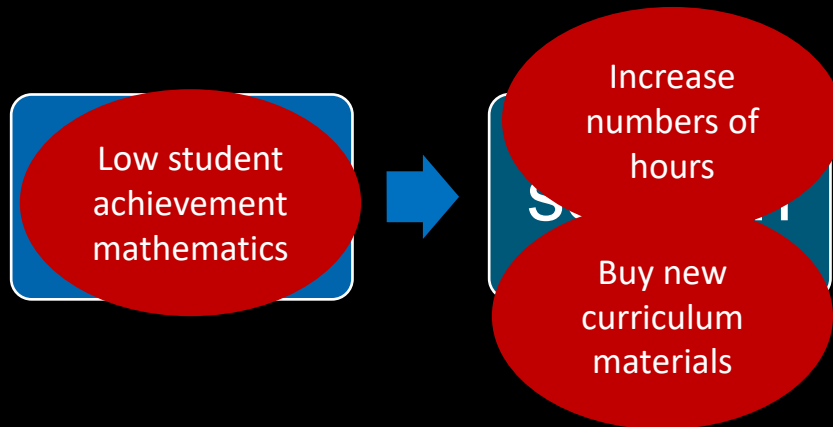
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### Data use for quality improvement



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### Data use for quality improvement



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### Data use for quality improvement

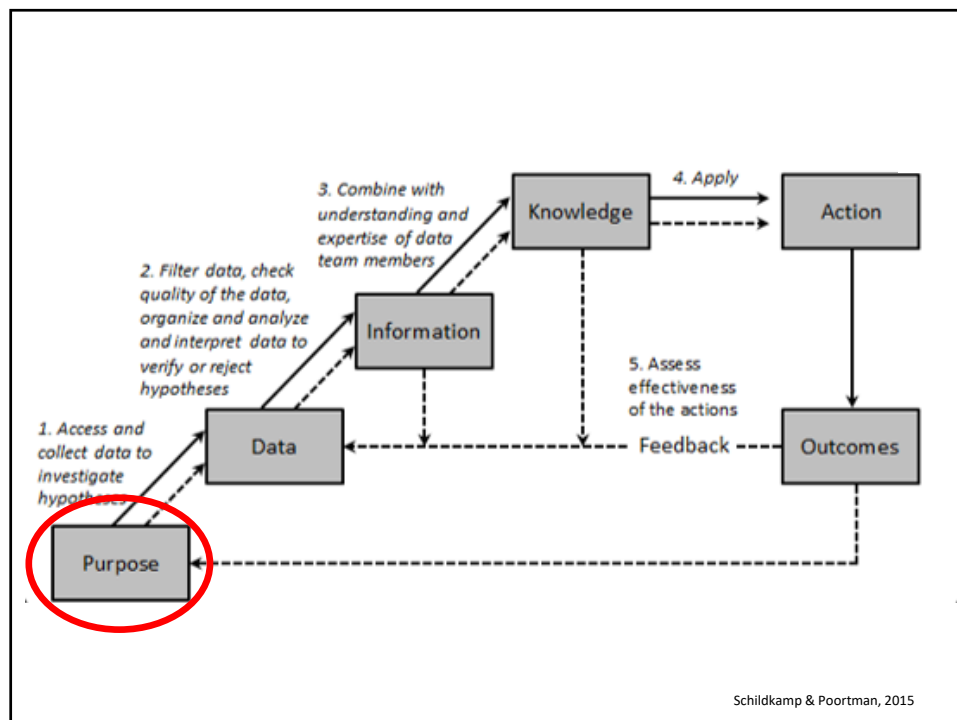


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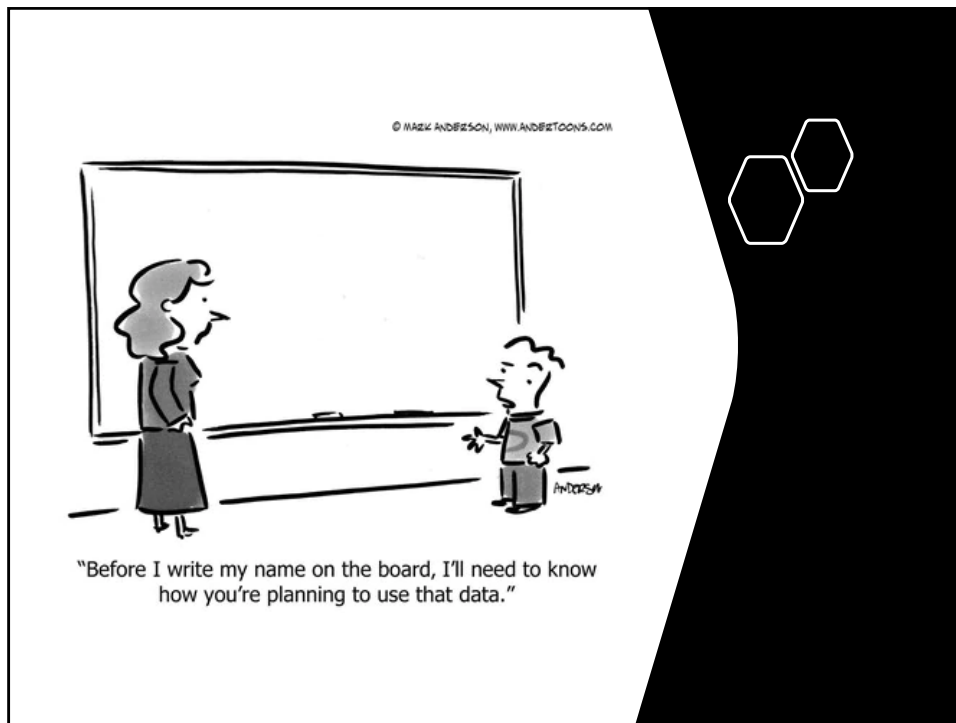
## Data use for quality improvement



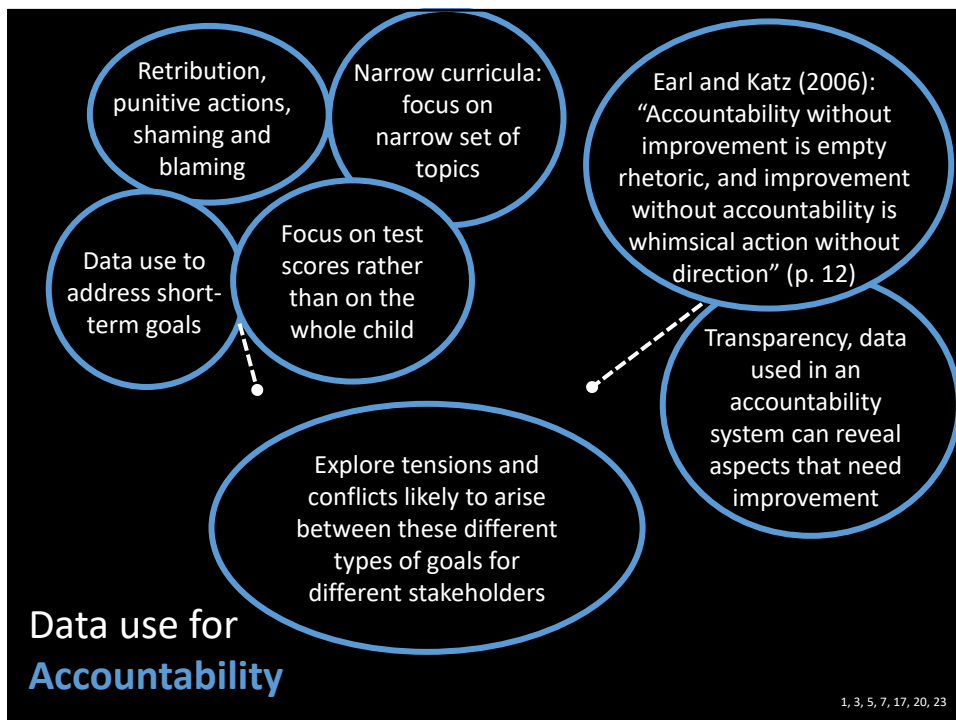
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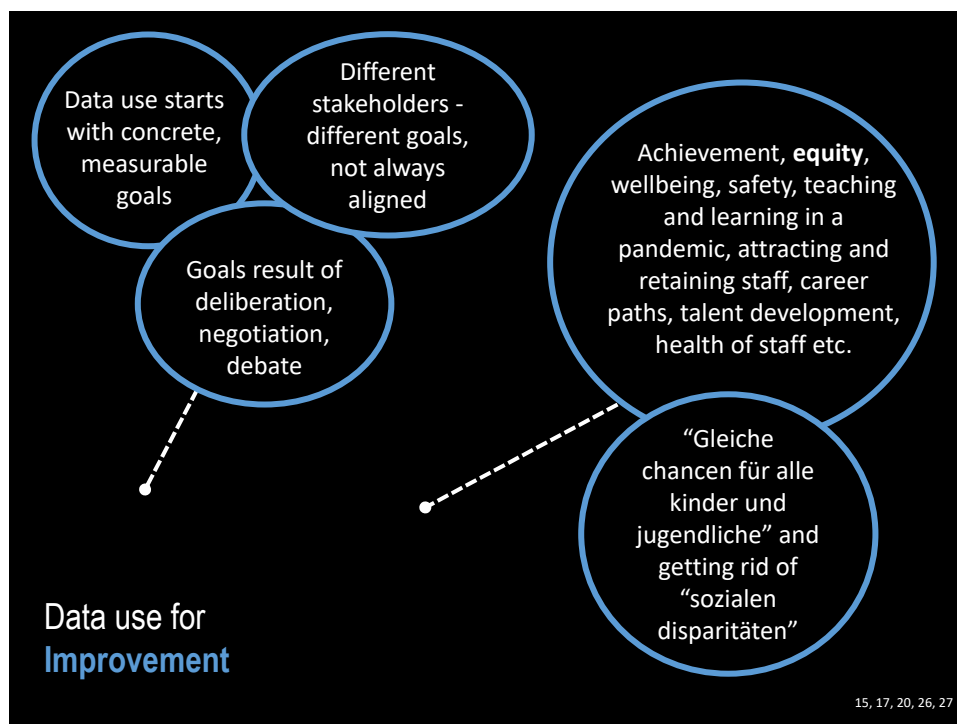
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A photograph shows a group of five people (three men and two women) sitting around a table in a meeting room. They are engaged in a collaborative activity, with cards and markers on the table. One man is holding a card, and another is pointing at it. The room has a whiteboard in the background.

**Data use and equity**

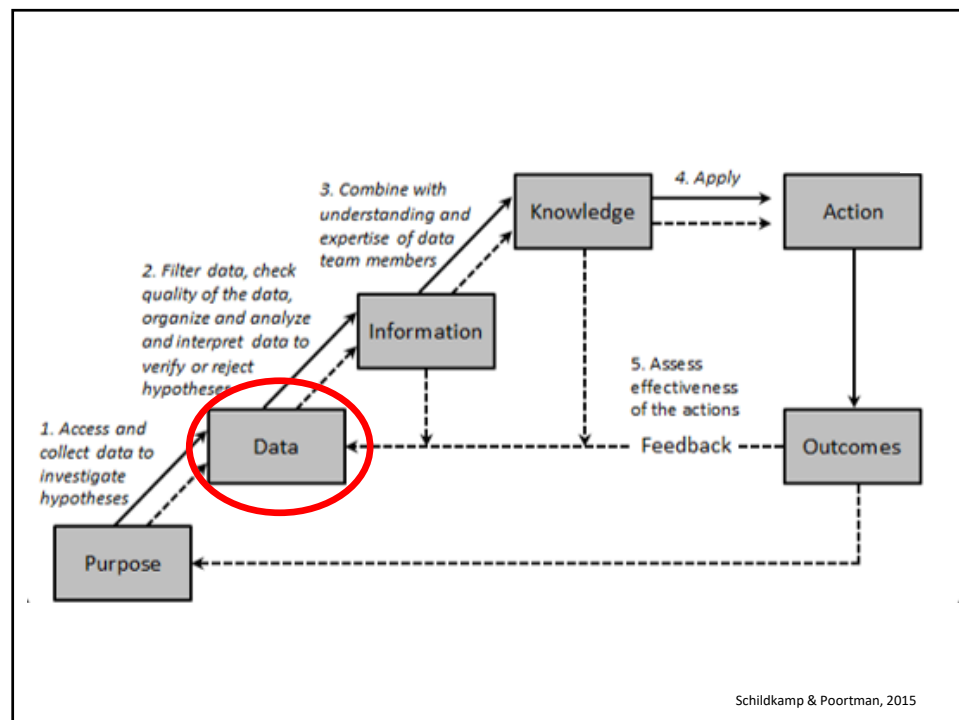
- Some people benefit more from (access to) data use
- Data can be used to challenge deficit beliefs about student abilities
- Data use can also perpetuate inequities by pushing teachers to engage in deficit thinking.
- Often as a result of (how schools deal with) accountability pressure: e.g., students as numbers, focused on a single measure, disadvantages low-income, minority students
- Climate of trust and safety needed and a focus on improvement, with an equity lens

4, 5, 6, 14, 17

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**Take away message 1:**  
Data use should start  
with a clear purpose  
(e.g., achievement,  
equity, wellbeing)

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Misconception:  
The most  
important  
source of data  
are test results.

Student  
learning cannot  
be captured  
only in test  
scores

Different types of  
data needed. Not  
only cognition, but  
also socio-  
emotional,  
attitudes, behavior,  
and more

Triangulate  
data, to  
capture needs  
of diverse  
students

Importance  
of Student  
voice data

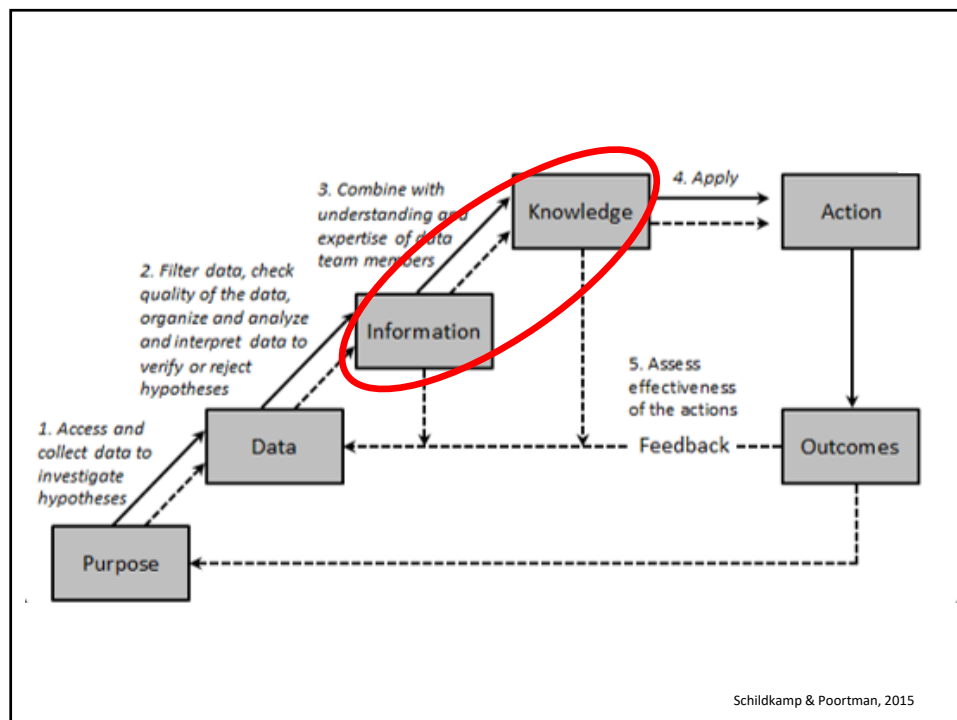
**Data**

15, 17, 20

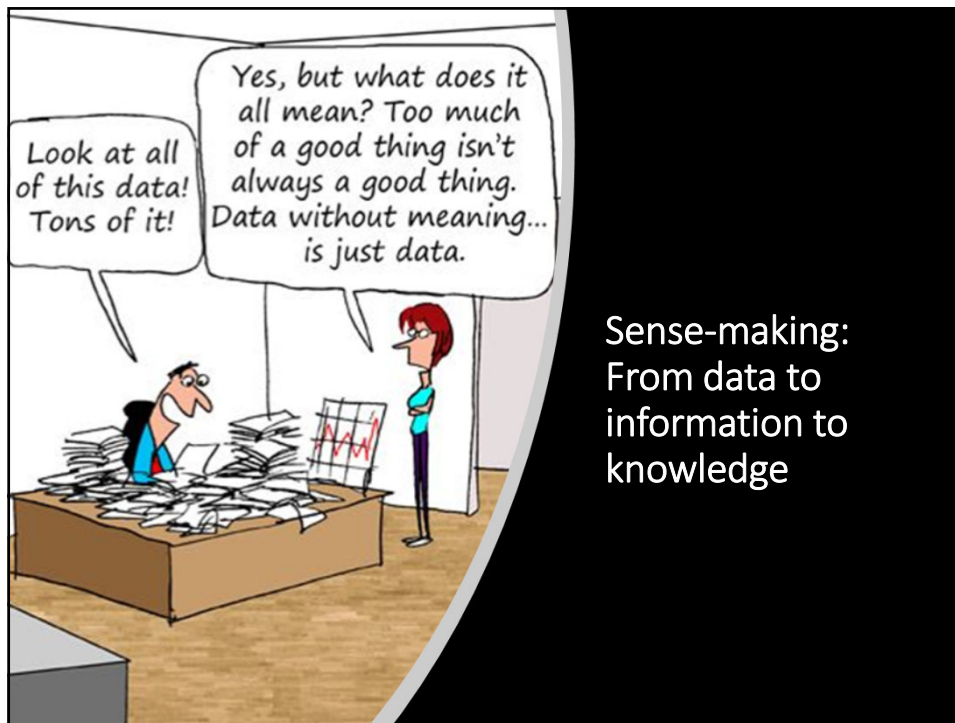
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**Take away message 2:**  
To achieve goals of e.g.,  
equity in “schüler in  
sozial deprivierten  
kontexten” more data  
are needed than just  
achievement data

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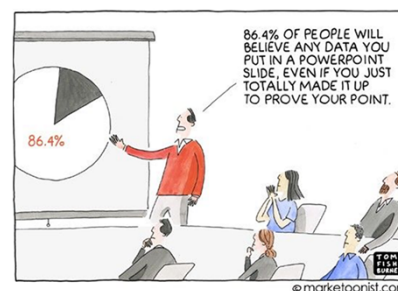
Sense-making:  
From data to  
information to  
knowledge

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## Sense-making

- Sense-making not straightforward or exclusively rational
- Data use involves professional judgement. People filter data through their lenses, experiences, and intuition
- Confirmation bias: use data to confirm pre-existing beliefs
- Collective engagement of different stakeholders
- Requires data literacy



2, 10, 11, 20, 24

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## Data literacy

Data literacy is the ability to transform information into actionable instructional knowledge and practices by collecting, analyzing, and interpreting all types of data (assessment, school climate, behavioral, snapshot, longitudinal, moment-to-moment, etc.) to help determine instructional steps. It combines an understanding of data with standards, disciplinary knowledge and practices, curricular knowledge, pedagogical content knowledge, and an understanding of how children learn (Mandinach & Gummer, 2016)

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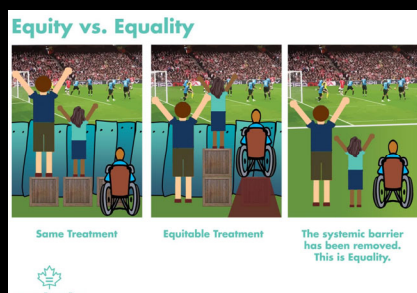


## Culturally responsive data literacy

The ability to transform information into actionable knowledge by collecting, analyzing, and interpreting diverse data to help determine instructional steps or inform other educational decisions, while taking particular note of the context, background, interests, strengths, and surrounding information of students that may affect their performance and behavior. The ability to use diverse sources of data to inform decision making about the whole child, using an equity lens and asset-based model to better serve the needs of all children (Mandinach et al., 2019).

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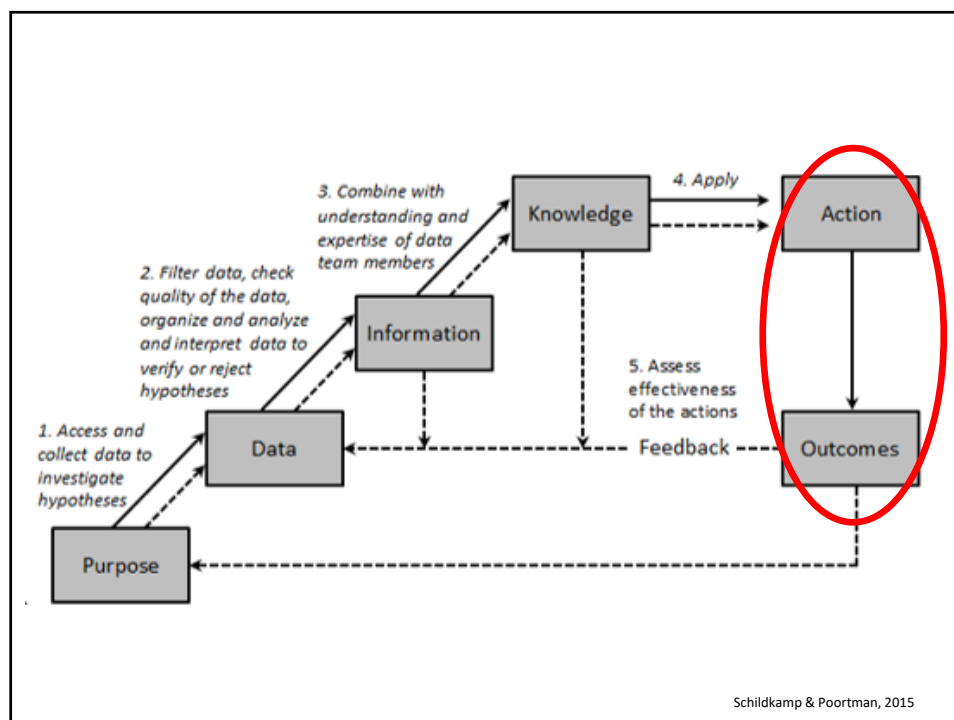
## Challenges



- Lack of adequate preparation at pre-service or in-service
- Educators (and the system) struggle with:
  - Setting clear and measurable goals, collecting data, and making sense of data
  - Identifying problems and pose researchable questions
  - Understanding how to use data effectively, without violating student privacy and confidentiality
  - Using an equity lens
  - Transforming data into **action** at the different levels of the system

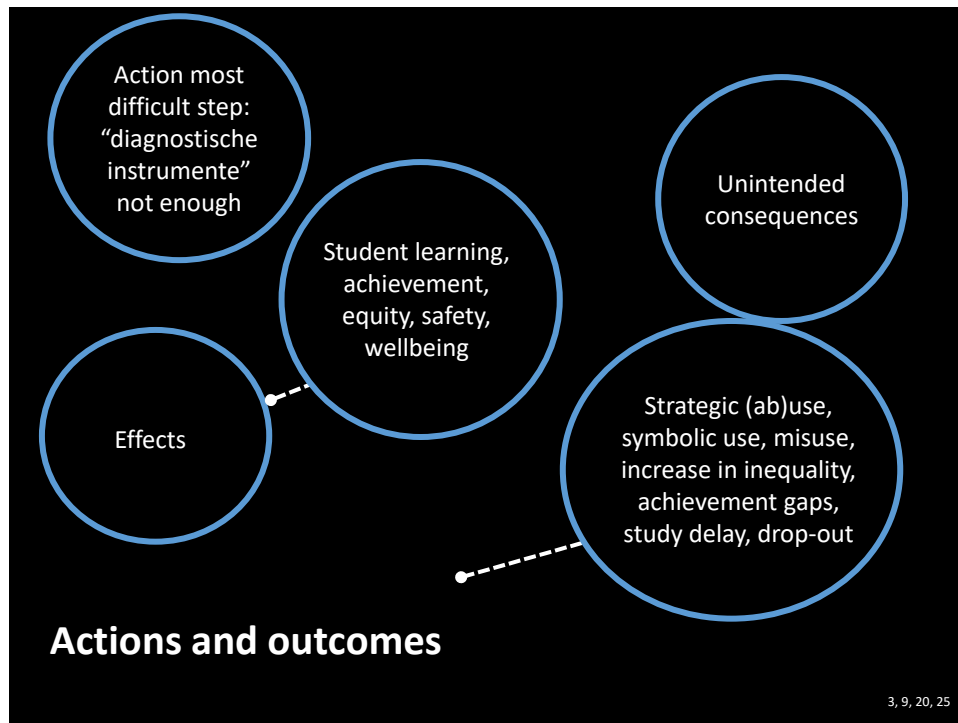
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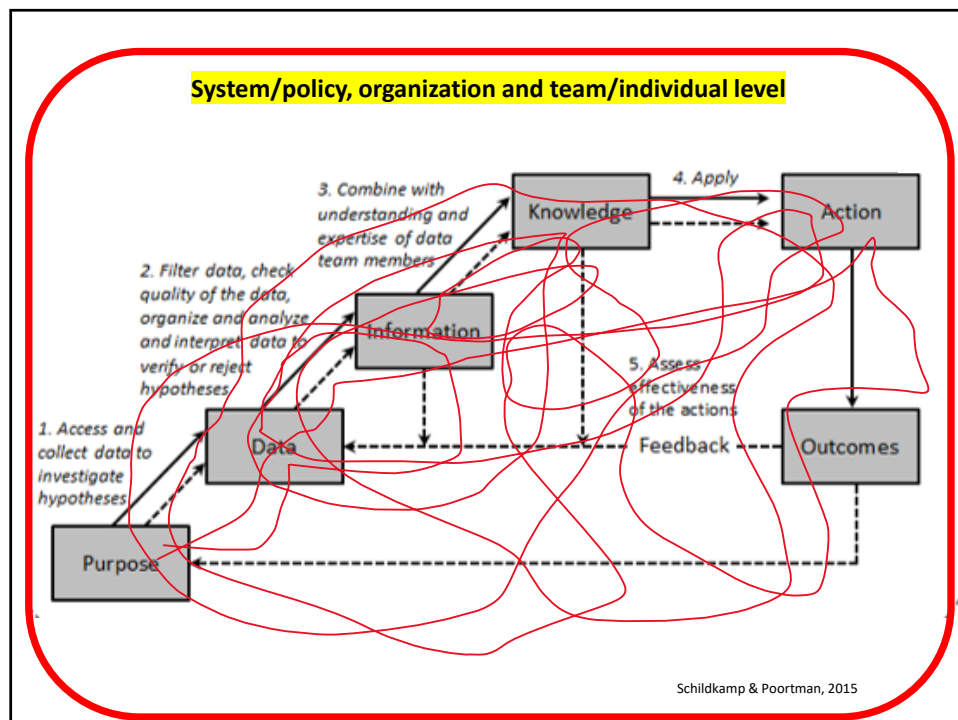


Schildkamp &amp; Poortman, 2015

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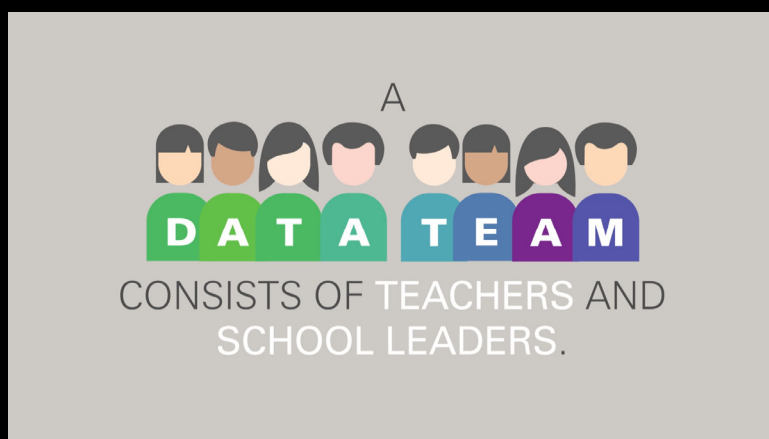


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## Data use as a collective effort in a PLC



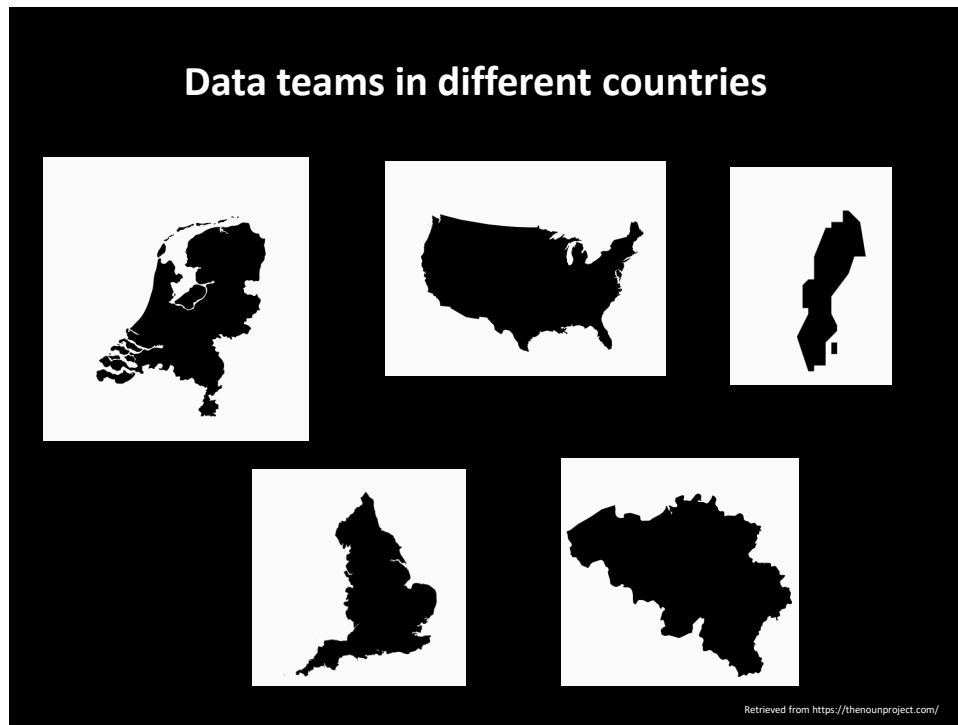
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## The datateam<sup>®</sup> procedure



- 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
- Studied data use in data teams since 2010, using a variety of quantitative and qualitative data

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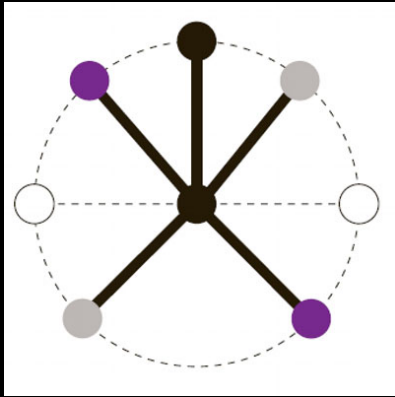
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## Data team functioning



- Difficult to formulate a measurable hypothesis
- Several rounds of hypotheses: First hypotheses often wrong
- Often external attribution
- 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
- Data use should not happen in isolation, but in a PLC

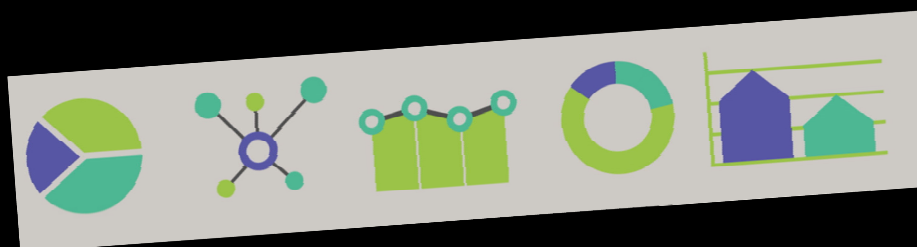
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**Take away message 3:**  
Effective data use  
requires a collective  
effort (e.g., in a PLC or  
PLN)

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## Effects of data teams




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	Effects of data teams
<b>Level 1: Satisfaction</b>	<ul style="list-style-type: none"> <li>• (very) satisfied about support external facilitator</li> <li>• moderately satisfied about process and progress</li> <li>• 'good'; 'fun'</li> </ul>
<b>Level 2: Knowledge and skills (data literacy)</b>	<ul style="list-style-type: none"> <li>• Knowledge and skills increased significantly</li> <li>• 'learnt how to use calculations in Excel'; what + how of qualitative analysis; 'you really need evidence'</li> </ul>
<b>Level 3: use of data</b>	<ul style="list-style-type: none"> <li>• Data use for instruction: examples of use in interviews, e.g. comparing and discussing exam results and prepare students better for particular exam questions (explanation and practice)</li> </ul>
<b>Level 4: Student achievement</b>	<ul style="list-style-type: none"> <li>• Student achievement increased significantly in majority data team schools (large effect sizes ranging from <math>d=0.54</math> to <math>0.66</math>)</li> </ul>

8, 12, 19

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## Conclusion

- Data use not rational and technical process, it involves human aspects (e.g., emotion)
- Data use requires trust/safe environment & focus on learning
- Data literacy is not/limited in teacher training, in service PD needed
- Do not start with data, start with problems and goals (1)
- To capture the whole child, different data sources needed (2)
- Data use requires sense-making and should be a collective effort (3)

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We firmly believe that one of the strengths of DBDM, if done effectively, appropriately, and responsibly, is for data use to enable educators to make more culturally sensitive and equitable decisions based on their knowledge of their students and the contextual factors that may impact them on a daily basis. This will lead to higher quality and equity for all students! (Mandinach & Schildkamp, 2020)

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Thank you for your attention!

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