The Use of Data Across Countries: 
Development and Application of a Data Use Framework

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EU DATAUSE Project: 5 Key Phases

1. Conduct Research and Develop Data Use Theory
2. Develop Data Use Governance Structures in Schools
3. Diagnose Schools’ Ability to Use Data Effectively
4. Provide Data Use Professional Development
5. Disseminate Best Practices Everywhere & Across All Levels
Overview of the presentations

**Paper 1:** The Use of Data Across Countries: Development of a Data Use Framework  
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**Paper 2:** Data Use in Schools: A Cross Country Survey Study  
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**Paper 3:** EU DATAUSE project: Development of the Data Use Professional Development Course  
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Paper 1: The Use of Data Across Countries: Development of a Data Use Framework

Kim Schildkamp, k.schildkamp@utwente.nl
Conduct Research and Develop Data Use Theory

Objectives:

1. Through research, understand current data use practices in partner countries, including: Poland, UK, Germany, Lithuania, and the Netherlands.

   Research questions included:

   ○ How does a country’s policy influence data use?
   ○ For which purposes do school leaders and teachers use data?
   ○ Which factors influence the use of data?

2. Based on the results of the research, additional literature from previous studies, and partners’ international experience, develop a theory for effective data use in education
Data Use Framework (Schildkamp & Kuiper, 2010)

**School organizational characteristics**
- School leadership: distributed leadership and support for data use
- Teacher collaboration
- Vision, norms, and goals for data use
- Structuring time to use data
- Training for data management and use
- Designated data expert in the school
- Pressure and support

**Data characteristics**
- Information management system, access to:
  - Timely data
  - Accurate data
  - Reliable and valid data
  - Relevant data
  - Data, which coincides with the needs

**Data use**
- Genuine improvement actions
  - Instructional purposes
  - Supporting conversations
  - Professional development
  - Encouraging self-directed learning
  - Policy development and planning
  - Meeting accountability demands
  - Legitimization actions
  - Motivating students and staff
  - Personnel decisions
- Unintended responses
  - Strategic use
  - Misuse
  - Abuse

**Data user characteristics**
- Data use skills
- Buy-in and conviction in data (data empowerment)
- Perceived ownership (teacher autonomy)
- Locus of control
Quality, Capacity, and Culture – Data Use Framework (PCG, 2010)

Data Use Theory of Action

Sustained | Systemic | Student Centered

Focused Results

Increased Student Achievement

Data-Driven Actions

Policy
School Improvement Planning, PD, Time

Programs
Program Evaluation, Curriculum Gaps

Practice
Sharing Data, Observing Practice

Placement
Differentiating Instruction, Flexible Grouping

Quality
Accurate Timely Relevant Complete

Capacity
Data Integration Analysis Tools Skills Structures

Culture
Commitment Beliefs Collaboration Leadership

Conditions for Data Use

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Method: Mixed methods

- Interviews with school leaders and teachers
- Secondary education:
  - Germany: 12 respondents of two schools
  - Netherlands: 32 respondents of six schools
  - Lithuania: 15 respondents of two schools
  - Poland: 13 respondents of two schools
  - England: 14 respondents of four schools
- Policy documents
## Research Results: Enablers and Barriers

Each finding easily fit into one of three types of characteristics:

| Organizational         | DE | NL | LT | PL | UK |
|------------------------|----|----|----|----|----|
| Structured Time set aside |    |    |    |    |    |
| Teacher collaboration  |    |    |    |    |    |
| Data expert            |    |    |    |    |    |
| Training and support   |    |    |    |    |    |
| Vision, norms and goals |    |    |    |    |    |
| School leader support  |    |    |    |    |    |

| Data                    | DE | NL | LT | PL | UK |
|-------------------------|----|----|----|----|----|
| Accessibility and availability of the data and information logistics |    |    |    |    |    |
| Quality of the data     |    |    |    |    |    |
| Tools supporting data analysis, interpretation and use |    |    |    |    |    |

| User                    | DE | NL | LT | PL | UK |
|-------------------------|----|----|----|----|----|
| Attitude towards data   |    |    |    |    |    |
| Knowledge and skills    |    |    |    |    |    |
Each finding easily fit into one of three consistent categories

| School Development | Policy development and school improvement planning | DE | NL | LT | PL | UK |
|--------------------|----------------------------------------------------|----|----|----|----|----|
|                    | Teacher development                                | DE | NL | LT | PL | UK |
|                    | Set and monitor implementation of goals            | LT | UK |
|                    | Motivating staff                                   | UK |
| Accountability     | Communication with parents                         | DE | LT | PL | UK |
|                    | To meet accountability demands                     | NL | PL |
|                    | Public relations                                   | DE | NE |
|                    | Communication with other schools                   | LT |
| Instructional      | Monitor progress of students                        | DE | NL | LT | PL | UK |
| Development        | Adjust instruction                                 | DE | NL | PL | UK |
|                    | Curriculum development                             | PL | UK |
|                    | Motivating and rewarding students                  | UK |
Data Use Model

Outcomes
- Student Learning
- Stakeholder Learning

Policy

Data-Driven Decisions
- School Development
- Accountability
- Instructional Development

Enablers and Barriers
- Organization
- Data
- Users
Develop Data Use Governance Structures in Schools

Objectives:

1. Establish partner-schools across each of the partner countries to pilot implementation of the data use theory across the EU

2. Create a team within each partner-school, known as the Professional Learning Community (PLC) Data Team, that will organize, manage, and disseminate the data use model throughout its schools.

3. Identify a data use champion, known as a Data Coach, in each of the partner-schools who will:
   - Go through intensive training on data use
   - Deliver in person the data use training course to the school team
   - Provide coaching and consulting on data use in their school
   - Maintain a ‘can do’ approach to help sustain the success of the project long term
Thank you very much for your attention!
Paper 2:
Data Use in Schools: A Cross Country Survey Study

Louisa Karbautzki (karbautzki@ifib.de) & Andreas Breiter (abreiter@ifib.de)
Diagnose Schools’ Ability to Use Data Effectively

Objectives:

1. Diagnose data use practices within the partner-schools and their current capacity to use data effectively

2. Share the results of the diagnosis with the Professional Learning Communities to help plan for the needed professional development

3. Re-administer the survey after the initiative to evaluate the Professional Learning Communities’ progress
DATAUSE Survey

- Survey items (78) were based on the data use framework
- Participants were asked to rate items by their accuracy or frequency
- 2011: 368 participants from 10 schools in 5 countries
- 2012: 228 participants from 7 schools in 4 countries

| Data Accessibility | Strongly Agree | Agree | Disagree | Strongly Disagree | Don’t Know | Not Applicable |
|--------------------|----------------|-------|----------|-------------------|------------|----------------|
| 1. I have access to student data within an information technology system | □ | □ | □ | □ | □ | □ |
| 2. I can go to one system to find all relevant data about my students | □ | □ | □ | □ | □ | □ |
| 3. I have access to technology that helps me analyze my data | □ | □ | □ | □ | □ | □ |
| 4. Data about my current students are available at the beginning of each school year | □ | □ | □ | □ | □ | □ |
| 5. As new students arrive in the middle of the year, data about them are made available to me in a timely manner | □ | □ | □ | □ | □ | □ |

| User Skills | Strongly Agree | Agree | Disagree | Strongly Disagree | Don’t Know | Not Applicable |
|-------------|----------------|-------|----------|-------------------|------------|----------------|
| 18. I have the skills to change my teaching based on data | □ | □ | □ | □ | □ | □ |
| 19. I am able to use data to diagnose student learning needs | □ | □ | □ | □ | □ | □ |
| 20. I know the meaning of basic assessment terms and concepts (e.g., inference, validity, reliability) | □ | □ | □ | □ | □ | □ |
| 21. I know how to interpret the assessment reports that I am given | □ | □ | □ | □ | □ | □ |
| 22. I feel comfortable interpreting data presented graphically | □ | □ | □ | □ | □ | □ |
First steps of the survey analysis

- Individual school reports
- Reliability analysis of survey categories
- Regression analyses within and accross countries
Factor Analysis: Finding the „Model of Best Fit“

- Survey categories formed 11 factors:
  - Data Accessibility, Data Quality
  - User Skills, User Attitudes
  - School Leadership, School Cooperation, School Vision & Norms, School Training & Support
  - Using Data for Accountability, Using Data for School Development, and Using Data for Instructional Development

- Which factors change together? Every factor correlates with all the other factors!

- Next step: Find a (structural equation model) that visualizes the current state of data use for each country.
Cross-Country Highlights 2011 (1)

- More than 50 percent of the respondents agreed or strongly agreed that...
  - “...it is important to use data to diagnose individual student learning needs.”
  - “...data can offer information about students that was not already known.”
  - “...[their] principal or assistant principal(s) encourage data use as a way to support effective teaching”
  - “...[they] would like to collaborate more with educators about using data”
Cross-Country Model 2011 (1)

- Factors on the school side are all interdependent
- School Leadership: support from school leaders is a necessary condition for data use in schools
Cross-Country Model 2011 (2)

- 3 factors are not linked at all and thus do not play a significant role in data use in these schools, yet
  - User Attitudes
  - User Skills
  - Using Data for Instructional Development
Factors addressed in the DATAUSE course pilot are now linked to other factors.

The correlation between School Leadership and Data Quality and Accessibility plays a role, now...
Comparison of Cross-Country Means 2011-2012

Data Accessibility
- Mean 2011: 1.92
- Mean 2012: 2.11

Data Quality
- Mean 2011: 1.82
- Mean 2012: 2.00

User Attitudes
- Mean 2011: 2.21
- Mean 2012: 2.27

User Skills
- Mean 2011: 1.98
- Mean 2012: 2.12

School Leadership
- Mean 2011: 1.93
- Mean 2012: 2.21

School Cooperation
- Mean 2011: 1.87
- Mean 2012: 2.01

School Vision and Norms
- Mean 2011: 1.57
- Mean 2012: 1.89

School Training and Support
- Mean 2011: 1.38
- Mean 2012: 1.08

Using Data for Accountability
- Mean 2011: 1.91
- Mean 2012: 2.07

Using Data for School Development
- Mean 2011: 1.79
- Mean 2012: 2.05

Using Data for Instructional Development
- Mean 2011: 1.95
- Mean 2012: 2.50
Thank you very much for your attention!
Paper 3:
EU DATAUSE project: Development of the Data Use Professional Development Course

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Provide Data Use Professional Development

Objectives:

1. **Develop an in-depth comprehensive professional development course** designed to teach and implement data use best practices

2. **Train the Data Coaches** to be able to successfully deliver the course and implement best practices
Data Use Course Goal

To build the collective capacity of a Professional Learning Community (PLC) to use data effectively to make decisions that will promote continual school improvement, by use of:

- Technical skills
- Analytic skills
- Collaborative skills

Data Use Inquiry Process
Data Use Inquiry Process

Diagnosis
- Why did our students...?
- Why are our teachers...?
- Why are our parents...?

Doing
- How do we fix...?
- What do we do about...?
- How do we build upon...?

Evaluation
- How successful were we?
- What can we do differently?
- What can we do more of?

Discovery
- How did our students...?
- In which specific areas...?
- Which students...?

Preparation
- How do we organize...?
- What should we prepare...?
- What do we need...?
Data Use Course Curriculum

**Preparation**
How do we organize for data use?
- Module 1: Getting Started – Analyzing Survey Results
- Module 2: Data Literacy

**Discovery**
What’s the issue or problem?
- Module 3: Identifying a Problem
- Module 4: Evaluating Data
- Module 5: Analyzing Discovery Data

**Diagnosis**
What’s the root cause?
- Module 6: Hypothesizing Root Causes
- Module 7: Analyzing Root Cause Data

**Doing**
What are we going to do about it?
- Module 8: Brainstorming Initiatives
- Module 9: Developing Action Plans
- Module 10: Monitoring Implementation

**Evaluation**
What results did we get?
- Module 11: Preparing for Evaluation
Data Use Course in a Gimnazjum in Lodz

- 357 students
- 14 departments
- 39 teachers
- 6 course participants
- 2 data coaches
Preparation Phase

**Preparation**
How do we organize for data use?

**Discovery**
What’s the issue or problem?

**Diagnosis**
What’s the root cause?

**Doing**
What are we going to do about it?

**Evaluation**
What results did we get?
Identify a problem or issue

Students with different learning potentials tend to underperform in the Humanities studies in the school-leaving exam.

Focusing questions

What are the results in Polish in the school-leaving exam?

Clarifying questions

Which specific skills are causing the most difficulty?

Data analysis!

Students experience problems with both: long and short forms of writing in Polish.

Preparation

How do we organize for data use?

Discovery

What is the problem?

Diagnosis

What is the root cause?

Doing

What are we going to do about it?

Evaluation

What results did we get?
Diagnosis phase – root cause definition

Problem: Students experience problems with both: long and short forms of writing in Polish.

Because...
Students tend to avoid any short or long forms of writing and thus, give one or two-sentenced replies to open-ended questions.

Because...
Students do not feel motivated to use short or long forms of writing.

Because...
Teachers administer school tests which are mainly based on close-ended questions.
Doing phase – action planning

Preparation
How do we organize for data use?

Discovery
What is the problem?

Diagnosis
What is the root cause?

Doing
What are we going to do about it?

Evaluation
What results did we get?

Problem
- Students have difficulty with both: long and short forms of writing in Polish

Strategies
- To promote long and short forms of writing in Polish, at all subjects
- To promote Polish grammatical and lexical correctness in students’ writing

Action Plan
- In Science – to include more open-ended questions in school Science tests and give marks for the correct use of Polish
- In Languages – to engage students into translation activities and give marks for the correct use of Polish
- In Polish – to provide other teachers with a set of guidelines for checking Polish grammar, punctuation and lexical items

The testing phase takes one month and then all the departments report to the PLC on the implementation of the Action Plan.
### Evaluation phase – results assessment

| Preparation | How do we organize for data use? |
|-------------|----------------------------------|
| Discovery   | What is the problem?             |
| Diagnosis   | What is the root cause?          |
| Doing       | What are we going to do about it?|

**Evaluation against the improvement targets**

| Problem definition | Improvement target |
|--------------------|--------------------|
| Students have difficulty with both: long and short forms of writing in Polish | The increase of the EVA indicator in the essay writing skills area from 0.34 to 0.5 starting from the examination session 2013. |

| Root cause of the problem (student ) | Improvement target |
|-------------------------------------|--------------------|
| Students do not feel motivated to use short or long forms of writing. | Students feel motivated to use short or long forms of writing due to the new marking system. |

| Root cause of the problem (teaching practice ) | Improvement target |
|-----------------------------------------------|--------------------|
| Teachers’ tendency to administer tests with close-ended questions only. | 25% of each test in any subject includes open-ended questions. Marking of all tests includes also linguistic correctness. |
Dissemination – Sharing lessons learnt

Fears and challenges

- “Data Use” feels too abstract
- The inquiry process takes a significant amount of extra time
- There may be resistance from the faculty due to additional responsibilities
- “It is a lot of paper work”

Conditions for success

- Convincing school leadership to take part in the process
- Ensuring appropriate staffing of the data team
- Appointing a leader for the data team
- Involving the whole faculty in the process
“We have bigger interest in data, we look at it more carefully”

The course gave us the impetus to investigate different subjects of our school”

„We explore more deeply how we teach”

“Thanks to the program, we standardized the process of approaching problems and tackling them”

“We will continue working according to the Data Use course methodology in the future”
Using Data for Improving School and Student Performance

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