# Comparative Analysis

# Data Use in Germany, the Netherlands, Lithuania, Poland and England

Using Data for Improving
School and Student Performance

Education and Culture DG
Lifelong Learning Programme

DATAUSE: Comenius Multilateral Project 510477-2010-LLP-PL
Agreement Number: 2010-4113/001-001

## 1.    Introduction and theoretical framework

This report focuses on the use of data for school improvement, as well as the factors influencing the use of data. Three research questions underlie this study:

1.  How does a country's policy influence data use?
2.  For which purposes do school leaders and teachers use data?
3.  Which factors influence the use of data?

The main objective of this comparative study is to come up with a data use framework we can use in our Comenius project. Since a generally accepted "data use" framework is missing, we developed our own framework (see Figure 1) by conducting an extensive literature review on data use and related fields (see for example: the special issue of the American Journal of Education, 2006, 112, 4; Black & William, 1998a; 1998b; Coburn & Talbert, 2006; Earl & Fullan, 2003; Ikemoto & Marsh, 2005; Honig & Coburn, 2008; Kelly & Downey, 2010; Kelly, Downey & Rietdijk, 2010; Kerr et al., 2006; Ronka, Geier, & Marciniak, 2010); Schildkamp, 2007; Schildkamp & Kuiper, 2010; Schildkamp & Teddlie, 2008, Schildkamp, et al., 2009; Visscher, 2002; Vanhoof et al., 2009; Verhaeghe et al., 2010; Wayman, 2005; Wayman et al., 2007; Wohlstetter et al., 2008). Versions of this framework were published in Schildkamp and Kuiper (2010) and Schildkamp, Lai & Earl (in press).

In the theoretical framework, it is hypothesized that several variables with regard to organizational-, data- and user characteristics influence the use of data. The policy context (such as pressure for achievement) may also influence data use within schools. Teachers and school leaders can use data, such as assessment and survey data, for different purposes. For example, data may be used for instructional purposes Young (2006); to support conversations with parents, students, (fellow) teachers, and (fellow) administrators (Breiter & Light, 2006; Brunner et al., 2005); to shape professional development (Brunner et al., 2005; Breiter & Light, 2006); for encouraging self-directed learning by giving the data to students (Breiter & Light, 2006; Brunner et al., 2005; Young, 2006); for policy development and planning (Breiter & Light, 2006; Brunner et al., 2005; Coburn & Talbert, 2006); for meeting accountability demands or complying with regulations (Coburn & Talbert, 2006; Kennedy, 1984); for legitimizing existing or enacted programs (Coburn & Talbert, 2006; Diamond & Spillane, 2004); for motivating students and staff, by for example celebrating achievement and improvement (Diamond & Spillane, 2004; Kerr et al., 2006); or for decisions related to personnel (e.g. evaluating team performance and determining and refining topics for professional development) can be based on data (Kerr et al., 2006; Wayman & Stringfield, 2006).
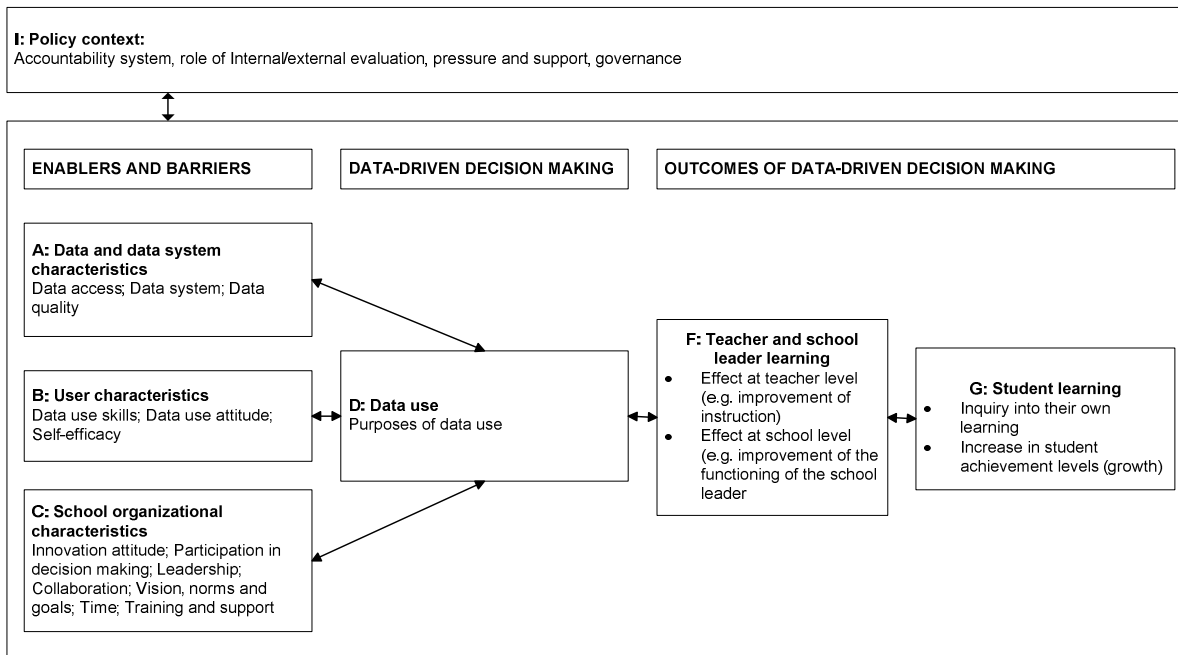
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*Figure 1*        A comparative study into data use: Theoretical framework

The use of data may lead to an effect on teacher-, school leader-, and student learning. Teacher and school leader learning is defined in this study as changes in attitude (e.g. towards data use), knowledge (e.g. pedagogic knowledge) and behavior (instructional or leadership strategies) (Guskey, 1989). For example, a teacher who is not satisfied with certain assessment results may decide to analyze the test results more critically. Based on these data he may come to the conclusion that he should make changes in his teaching. As a result, he may start using different instructional strategies (teacher learning: behavior). Data on the next test results can tell him whether or not his changes were successful led to higher student achievement results (student learning) (Boudett & Steele, 2007). However, it is also possible that data use may have unintended effects, such as stress and de-motivation among school staff as data may give the (surface) impression that they are performing poorly in some aspect of their practice.

## 2. Method

In all five countries, a replication of the Schildkamp and Kuiper study (2010) took place on a smaller scale. Interviews were held with teachers and (assistant) school leaders in each of the five countries (Germany, The Netherlands, Lithuania, Poland, and England) using a consistent interview schedule (see Appendix 1 and 2). Interviews in all schools were conducted to determine the applicability of the framework. The study focused on the purposes for which school leaders and teachers use data, and which variables promote and hinder the use of data. The interviews started with an open question that addressed current school-wide improvement initiatives, and whether or not data played a role in these activities. If data did play a role, the interviews prompted for the specific ways. Secondly, respondents were asked whether or not they used multiple data sources, such as assessment data from various sources or vendors.

In each focus country, respondents from at least two schools were interviewed. In Germany, 6 teachers and 6 (assistant) school leaders from two schools were interviewed. In the Netherlands, 11 teachers and 21 (assistant)

school leaders from six schools were interviewed. In Lithuania, 15 (assistant) school leaders from two schools were interviewed. In Poland, 11 teachers and 2 (assistant) school leaders from two schools were interviewed. In England, 6 teachers and 8 (assistant) school leaders from four schools were interviewed.

Documents (e.g. policy plans, literature, and OECD reports) were collected to describe the educational policy (related to data use) in each of the countries. In this study, reliability was fostered by using a systematized approach to data collection that is consistent with the research questions (Riege, 2003). We used a protocol, which described the research questions, data collection method and instruments, and analysis planned. Internal validity was enhanced by highlighting major patterns of similarities and differences betweens respondents' experiences and beliefs. Multiple sources of evidence or triangulation (i.e., interviews and different types of documents) where also used. External validity was realized by providing case-specific and cross-case descriptions, and describing the congruence with the theoretical framework (see also Poortman & Schildkamp, in press).

## 3.    Results

In the Tables below, the interview results for all the schools are summarized for each country and categorized by policy context, data use purposes, available data, data and data system characteristics, school organizational characteristics, and data user characteristics.

## 3.1    Results Germany:

The exact results of the German case studies (by Andreas Breiter, Louisa Karbautzi, and Angelina Lange) can be found in Appendix 3. Germany has 16 different states, and each state is responsible for providing education. The federal Ministry is mainly concerned with education research and educational planning. Cross-state coordination is provided by the Joint Commission of the State Education Ministers (KMK). Within the states, schools are centrally organized, and very limited autonomy exists for schools (see also Table 1). Decisions are mostly made at the Sate, provincial/regional level, and local level (OECD, 2008; 2010). Only with regard to organization of instruction is there autonomoy at the school level. Schools can choose the text books they want to use, but have to refer to a state level framework. The state designs and selects the programs that are offered and determines the range of subjects taught and the course content (OECD, 2008). Germany has a standard curriculum or partly standardized curriculum that is required, as well as mandatory national examinations and assessments (OECD, 2010).

Table 1    *Percentage of decisions made at each level of Government in German public lower secondary education (P. 488, OECD, 2008)*

|  | Central | State | Provincial/regional | Local | School |
|---|---|---|---|---|---|
| Germany total | 4 | 31 | 17 | 18 | 30 |
| Organization of instruction | - | 12 | - | - | 88 |
| Personnel management | 17 | 38 | 38 | - | 8 |
| Planning and structures | - | 71 | - | 14 | 14 |
| Resources | - | - | 29 | 54 | 17 |

| Table 2 | *Educational policy and Available data in Germany* |
|---|---|
| German policy | <ul><li>Federal Ministry mainly concerned with education research, educational planning, and cross-state coordination by a Joint Commission (KMK)</li><li>16 states, each state is responsible for providing education</li><li>Within the states schools are centrally organized, very limited autonomy for schools</li><li>Local education authorities provide school's infrastructure (e.g. facility management, administration and IT)</li><li>Since 2008 national education standards (German, Mathematics and Science), translated by states into state standards. These standards are assessed by means of central assessments.</li><li>School supervisory boards regulate internal issues by law and are responsible for planning, organization, steering and supervision of the education system (for example, regulation of compulsory education, content of courses, school locations). In some states these boards also conduct school inspections</li><li>States have their own student achievement testing systems</li><li>Internal evaluations are not compulsory, but school boards and other organizations offer tools and support</li><li>Types of data available differs per state: all have student achievement results, some have inspection and self-evaluation results</li><li>Little to no support for schools in the use of data</li></ul> |
| German data | <ul><li>School inspection report</li><li>School information brochure</li><li>School policy plan</li><li>Self-evaluation results</li><li>Administration data (intake, school leavers, class lists, absentees, contact data)</li><li>Student demographic data</li><li>Assessment/achievement data</li><li>Report cards</li><li>Final examination results</li><li>Individual monitoring of student performance and behavior in a logbook</li><li>External process evaluation of pedagogical projects</li></ul> |

Local education authorities provide each school's infrastructure (e.g. facility management, administration and IT). Since 2008 national education standards exists (German, Mathematics and Science), translated by states into state standards. Standards are assessed by means of state-wide central tests in 9th/10th grade, as well as for Abitur (12th / 13th grade). Additionally, independent state-wide central assessments are conducted in K-1,3rd and 8th grades. Internal evaluations are not compulsory, but school boards and other organizations offer tools and support. Types of data that are available differ per state: all have student achievement results, some have inspection and self-evaluation results. Little to no support exists for schools in the use of data. Training in data use happens sporadically and is usually linked to studies. After the evaluation of national test results, for example, the executing institutes will offer workshops. No nationwide training is established. The incentive of teaching hour reduction does exist in the German school system. Unfortunately, in our project schools, no teaching hour reduction for data use has been assigned ( yet). In Table 2, the German educational policy and data that are available in German schools is summarized.

Although the schools included in this study are regarded as advanced schools, the use of data is limited in both. In both schools, a lot of data are collected, but are not systematically used. School leaders mainly use data for administrative purposes. Teachers use data to monitor progress of students and to determine the need for individual student support or instructional changes. Data are usually discussed in subject meetings. The biggest deficit in

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Germany's school system is a missing general strategy of the education authorities with regard to data use. As schools have only limited *access* to data and no real *autonomy*, the data-driven decision-making process is either done on a different level, or it is not done at all. Schools have to collect data and transfer it to the education authorities, which requires a lot of effort and time. But the data is not fed back (e.g. *availability*) to the schools and the decisions based on this data are not transparent. Moreover, the data collection for the national learning performance measurements is carried out within the school and has many errors, resulting in *low quality* data.

There is a problem of interoperability between the different data sets. Hence, the relation between different data cannot be analyzed. There are no processes in place, which support the workflow and the roles between the different institutions. If in place, the *information systems* are heterogeneous and teachers select their own tools, which do not fit to the central information systems. There are no data standards and the ICT infrastructure for administrative purposes in schools does not allow collaborative or individual data use. So, *information logistics* is a necessary (although not sufficient) condition for data use in German schools.

In one of the schools studies, data are used to evaluate teacher performance, but no specific instruction or targetable improvement values or *goals* have been formulated. Moreover, data, such as final examination results are not always *timely* available, schools do not have enough *time* to analyze and use data themselves, teachers do not *collaborate* around data use and lack data analyses and data use *skills*. Finally, a lack of *support* on local and state level may have resulted in a limited use of data.

## 3.2    Results UK (England)

The exact results of the English case studies (by Phil Bourne and Eva Kunst) can be found in Appendix 4. England works with published national data sets (League tables). Schools in England have a lot of autonomy (see Table 3). Almost all decisions are made at the level of the school (OECD, 2008; 2010). Schools decide which textbooks they want to use, they select the programs that they will offer, decide on the range of subjects taught and the course content of these subjects (although they have to refer to a framework at the central level) (OECD, 2008). England does have a standard curriculum of partially standard curriculum that is required, but no mandatory national examination or assessments are required (OECD, 2010). However, schools are inspected by Ofsted, who provides schools with inspection reports. Internal evaluations using lesson observation, perception questionnaires, attainment and achievement data, are highly recommended. These evaluations are most frequently based around the Ofsted inspection framework. External inspections from external evaluation agencies are also optional, however, Ofsted evaluations are mandated and the frequency of which is dependent upon the success of the school (see Table 3).

Table 3    *Percentage of decisions made at each level of Government in public English lower secondary education (P. 488, OECD, 2008)*

|  | Central | State | Provincial/regional | Local | School |
|---|---|---|---|---|---|
| England total | 4 | - | - | 5 | 91 |
| Organization of instruction | - | - | - | - | 100 |
| Personnel management | 17 | - | - | - | 83 |
| Planning and structures | - | - | - | 20 | 80 |
| Resources | - | - | - | - | 100 |

Schools are likely to feel *pressured* to use data as they are evaluated by Ofsted and their performance will appear in League tables. In terms of *support*, there is no national training in the use of data, but many different types of *trainings* as well as data *tools* are available. There is an expectation that teachers will undertake continuous professional development activities and approximately 5 teaching days (out of 195) are allocated to this activity. No additional time or incentive is provided for additional training. Also, England has a national student database, as well as achievement and attainment tables, which makes information available in a systematic and largely accessible manner.

In this context, a wide range of different types of data (see Table 4) are used for different purposes by the four schools included in this study. Data are used for curriculum development; for placing students; for celebrating achievement and thereby motivating staff; to monitor and track student achievement; to evaluate and improve teacher performance; to set new targets for departments; to reward and motivate students; for policy development; to improve lessons; to improve the school's environment; to target instruction towards weak(er) and/or strong(er) students; and to improve communications with parents.

Table 4    *Educational policy and available data in England*

| England policy | <ul><li>External evaluations by Ofsted</li><li>External evaluations from other external agencies are optional</li><li>School self evaluation or internal evaluations (using lesson observations, perception questionnaires, attainment and achievement data) not mandatory, but recommended</li><li>More frequent inspections for schools that are inadequate or satisfactory and longer intervals for those judged well</li><li>Publication of school performance tables or league tables</li><li>Schools provide a wide range of data (e.g. postcode, deprivation indices, ethnic origin, mobility indicators) through linked information management systems to the Government at set times in the year. This results in a national student data base asd well as achievement and attainment tables</li><li>Each student has an unique pupil number, and a significant amount of data is available for each student</li><li>Availability of a broad range of tools that support schools in evaluation and target setting</li><li>No mandated or national training, but a range of training opportunities</li><li>Schools can compare themselves with other schools and against national performance</li></ul> |
|---|---|
| England data | <ul><li>Different types of student achievement, performance, progress and attainment results</li><li>Results from the primary school</li><li>Class management information</li><li>Attendance data</li><li>Quality assurance of parents</li><li>Lesson observations</li><li>Ofsted inspection report</li><li>Self-evaluations</li><li>Purchased external evaluations</li><li>Free school meals take up</li><li>Time spent on subjects</li><li>Exclusion rates</li><li>Teenage pregnancy's</li></ul> |

| Table 4 | *Educational policy and available data in England (Continued)* |
|---|---|
| England data | ▪ Different pupil surveys (for example, an attitude to learning survey) |
| | ▪ Staff questionnaires |
| | ▪ Parent questionnaires |
| | ▪ School plan and prospectus |
| | ▪ Teacher performance data |
| | ▪ Special needs data |
| | ▪ Student's voice data |
| | ▪ Student behavior data |
| | ▪ Staff data, such as attendance, information and hours of work of teachers |
| | ▪ Data on intake, transfer and school leavers |
| | ▪ Information from exit interviews |
| | ▪ Historical data and trend data |
| | ▪ Information from the local authority |
| | ▪ Indicators on deprivation based on postcode |

Although schools in England do complain that some data are not accessible or available in a timely manner, are not accurate (for example, they can not always use estimates of attainment, because they are influenced by deprivation factors), overall schools have *access* to a wide range of data and also have *tools* available to analyze and use data. Moreover, even though time and money are always an issue, schools also have access to *training* on data use (*knowledge and skills*) and *data systems* and two of the schools even mention having a *data expert* or data manager in their schools. Finally, *collaboration* around data use (e.g. discussing performance data) and *having a clear vision and goals* seem to be important.

## 3.3    Results Lithuania

The exaxt results of the Lithuanian case studies (By Daiva Penkauskiene and Lina Grinyte) can be found in Appendix 5. In Lithuania, schools are evaluated both externally and internally. External evaluations are carried out by the National Agency for School Assessment. Internal evaluations are obliged as well. Schools can use the internal audit methodology developed by the National Agency for internal evaluation or use their own system. Internal evaluations are carried out by the school administration in cooperation with teachers. Schools are likely to feel some kind of *pressure* to use data, because they are evaluated thoroughly (see Table 5).

The results of the interviews in the two Lithuanian schools show a desire to use data more extensively than that they currently are. Currently, different types of data (see Table 5) ared used for monitoring the implementation of the school's mission, vision and goals; defining new/strategic aims and objectives; and monitoring achievement.

The fact that schools are not using data as widely as they want to might be due to the *availability* of the data (for example, schools in England have much more and different types of data available), the fact that data is not always *timely* available, and a lack of *knowledge and skills* on how to analyze and use data (e.g. schools indicate needing a *data expert* as well as *training*).

The reason Lithuanian schools are able to use data to some extent is probably due to the fact that both the external and internal evaluation result in *usable, relevant, reliable and accurate data*, teachers *collaborate* around data, and schools have a *clear vision and goals* and can use data to monitor the implementation of this vision and goals.

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| Table 5 | *Educational policy and available data in Lithuania* |
|---------|------------------------------------------------------|
| Lithuania policy | ▪ External evaluations are carried out by the National Agency for School Assessment<br>▪ Self-evaluation is obliged<br>▪ Active participation of all community members in school governance and decision making<br>▪ Lithuanian education policy encourages implementation of transparent quality evaluation systems, resulting in schools conducting self evaluations all over the country<br>▪ Schools can use the internal audit methodology developed by the National Agency for School Assessment or use their own self-evaluation system<br>▪ Self-evaluations are carried out by the school administration in cooperation with teachers<br>▪ The National Agency for Schools Assessment provides pressure (e.g. schools are evaluated), but also support in terms of external experts |
| Lithuania data | ▪ Subject based reports<br>▪ Methodical group reports<br>▪ Internal school audit<br>▪ Lesson observations<br>▪ Examination results<br>▪ Teacher and parent survey results<br>▪ School based strategic and action plans<br>▪ Demographic pupil data<br>▪ School attendance data<br>▪ Achievement data<br>▪ Research results |

## 3.4    Results Poland

The exact results of the Polish case studies (By Małgorzata Marciniak) can be found in Appendix 6. An important act for Polish education is the Pedagogical Supervision Act passed in 2009, which lists three areas of school supervision: evaluation, control and support. The act also provides the requirements that all schools in Poland must meet when being externally evaluated by educational authorities. The Ministry of National Education provides curiculum standards; districts and municipalities control administration and financing; school directors choose which teachers to hire; and teachers choose a curriculum from a pre-approved list. School directors have autonomy as far as the decision making around hiring teachers, approving programs and textbooks, conducting internal evaluations. Poland has mandatory national examinations and assessments coordinated and implemented by the Central and Regional Examination Commissions (OECD, 2010) for example the 6th (primary education), 9th (lower secondary education), and 12th grade (upper secondary education) exit exams. Schools are both (in theory) internally and externally evaluated. Schools are likely to feel some kind of *pressure* to use these results (see Table 6). However, since the Act on Pedagogical Supervision is a rather new act, not all schools have been evaluated externally, nor have they conducted internal evaluations.

A lot of data are available (see Table 6); however these are mostly achievement data. These (value-added) data are also available online and can be accessed by parents, for example. Schools have electronic data systems in place and teachers can access these systems to find data on their students. These data are perceived to be *reliable, valid, and accurate*. Data are used for a wide range of purposes, including: grouping of students; monitoring progress of individual students and groups of students; monitoring the performance of teachers; identifying weak and strong aspects of schools, teachers,

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and programs; choosing an appropriate program of teaching; and adjusting lesson plans and goals according to needs of students.

Teachers *collaborate* around the use of data, usually in one subject-specific team meeting, where student outcome data is analyzed, usually at the request of the *school leader*. However, most of the communication takes place by e-mail or by informal communication. The school leader coordinates and supports the work of the teams in one of the schools. This school leader coordinates the work of the teams, provides structures, puts processes in place, participates in meetings, supports the development of an improvement plan, and monitors the implementation. In one of the schools studies, a *structured process for data use* and monitoring is lacking. Respondents in both schools *believe in the use of data*. Moreover, in one school teachers certainly have the *knowledge and skills* needed to work with data, as these teachers are certified examiners. In the other school, teachers indicate lacking the skills to use value added data.

Professional development around the use of data is not a standard offering to teachers or directors. Only motivated and innovative teachers and school directors develop competencies in this area, mainly through pursuing conference participation or individual reading and on-the-job learning. However, the drive towards developing data use competencies is gradually increasing as the state exam data and value added data are gaining more attention and are subjects of various regional or state-level analyses. Currently, teachers do not recevie reductions of teaching hours related to pursuing professional development in the area of data use.

| Table 6 | *Educational policy and available data* |
|---|---|
| Poland policy | <ul><li>Pedagogical SupervisionAct passed in 2009 sets evaluation requirements, introduces control and support measures, 16 Regional School Boards conduct external evaluations, districts and municipalities control administration and financing, school directors choose which teachers to hire and teachers choose a curriculum from a pre-approved list</li><li>Schools have autonomy regarding decisions related to the school's overall performance</li><li>National assessment exams at grade 6, 9, and 12 are administered by the Regional Examination Commission.</li><li>The Ministry requires that schools analyze data for school improvement (requirement 1.1 of the Pedagogical Supervision Act). This is checked during external evaluations.</li><li>External evaluations are carried out by a pedagogical supervision authority</li><li>Internal evaluations are carried out by headmasters in cooperation with teachers</li><li>Internal and external evaluations should be used as a basis and roadmap for school improvement planning</li><li>Teacher development centers provide (voluntary) professional development</li></ul> |
| Poland data | <ul><li>School internal assessment data</li><li>Final exam results from primary education</li><li>Diagnostic entrance test</li><li>Mock final exams</li><li>State administered exams results</li><li>Value added data</li><li>Student demographic data</li><li>Student survey results</li><li>Graduate survey results</li><li>Internal and external evaluation results</li></ul> |

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## 3.5    Results Netherlands

The reference to the exact results of the Dutch case studies (by Kim Schildkamp and Wilmad Kuiper) can be found in Appendix 7. In the Netherlands, schools have a lot of autonomy (see Table 7). Similar to England, almost all decisions are made at the level of the school (OECD, 2008; 2010). Schools decide which textbooks they want to use, they select the programs that they will offer, decide on the range of subjects taught and the course content of these subjects (although they have to refer to a framework at the central level) (OECD, 2008). The Netherlands do not have a standard curriculum of partially standard curriculum that is required; they do have mandatory national examinations, but no national assessments (OECD, 2010).

Table 7    *Percentage of decisions made at each level of Government in public Dutch lower secondary education (P. 488, OECD, 2008)*

|  | Central | State | Provincial/regional | Local | School |
|---|---|---|---|---|---|
| Netherlands total | 6 | - | - | - | 94 |
| Organisation of instruction | 11 | - | - | - | 89 |
| Personnel management | 12 | - | - | - | 88 |
| Planning and structures | - | - | - | - | 100 |
| Resources | - | - | - | - | 100 |

However, schools are held accountable for their functioning by the Dutch Inspectorate (e.g. *pressure*). As schools are responsible for the quality of education they provide, they have to conduct some kind of school self-evaluation to check their quality and improve if necessary (see Table 7). Different consultancy organizations offer data use trainings, but participation is up to schools. Also, schools decide for themselves if participation leads to hours of teaching reduction. Usually this is the case as lessons of these teachers have to be cancelled.

The results of the interviews in six Dutch schools show that, although a wide range of input, process and output data are available (see Table 8), but the use of data is rather limited. Only in two of the schools were data really being used by teachers and school leaders for school improvement purposes. Although several factors may have hindered more effective data use, such as a *lack of access* to *relevant* data that *coincides with the needs*, *a lack of time*, and a need for *training*, respondents of these two schools were able to use data. Factors that may have led to this success include teacher *collaboration* and involvement, a *clear vision, norms and goals* for data use, and having a *designated data expert* within the school. Moreover, *school leader support* and a belief in the use of data are important.

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Table 8 *Educational policy and available data in The Netherlands*

| Netherlands policy | - Decentralization<br>- Schools are responsible for the quality of education and need to engage in school self-evaluation<br>- Schools are held accountable by the Dutch Inspectorate<br>- School inspectors judge a school based on its self-evaluation and other types of data<br>- Actual school inspection once every four year, but more frequent inspections for schools that are judged inadequate or satisfactory based on data<br>- Schools are expected to provide their community and stakeholders with insight into their processes, choices, and results<br>- Schools are supposed to provide their boards of supervision with insight into the adequacy of their management, policy, and steering<br>- Difficult to sanction schools as long as they comply with legal requirements<br>- At the end of secondary education students have to pass a final examination. Final examinations consists of an internal exam (chosen or developed by the school) and an external national exam |
|---|---|
| Netherlands data | - School inspection data<br>- School self-evaluation results<br>- Data on intake, transfer, and school leavers<br>- Final examination results<br>- Assessment results<br>- Report cards<br>- Student and parent questionnaire data and/or focus group results<br>- Student demographic data<br>- Attendance data<br>- Staff data (e.g. sick leave, age, degrees)<br>- Results from primary schools<br>- Results in higher education<br>- School plan<br>- School prospectus |

An *external locus of control* present in two of the schools may have hindered data use as these teachers stated that "assessment results are different each year, depending on whether you have good or not so good students". Finally, *information overload* may prevent effective data use, as was found in two schools. In these two schools respondents complained that there was too much data out there and that "data are not always accessible, partly because there are too much data available".

## 3.6 Results: comparison of the influencing factors across countries

In Table 9, the different purposes for data use per country are summarized. Table 10 compares the results per country for the different influencing factors (e.g. data and data system characteristics, school organizational characteristics, and user characteristics).

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Table 9    *Data use purposes per country*

| Germany | Netherlands | Lithuania | Poland | England |
|---|---|---|---|---|
| ▪ Data are used for school improvement planning (1)* <br> ▪ Assessment data are used to track teacher development (1) <br> ▪ Public relations: administrative data and statistics (2) <br> ▪ Assessment results and self-evaluations are used for instructional changes (2) <br> ▪ Data, such as assessment results are used to form learning groups (1) <br> ▪ Student data are used to monitor progress (2) <br> ▪ Data are used for parent feedback (1) | ▪ Data, such as achievement and survey data are used to monitor progress and identifying areas of need (6) <br> ▪ Data, such as inspection and self-evaluation results, are used for policy development and planning (6) <br> ▪ Assessment, final examination results, and data on intake, transfer and school leavers, are used to evaluate teacher performance and to discuss with teachers (6) <br> ▪ Inspection results, if satisfactory, are used for public relations (3) <br> ▪ Self-evaluation results are used to meet accountability demands (3) <br> ▪ Data, such as assessment results, are used to make instructional changes (5) | ▪ Data are used for planning and assessing change (2) <br> ▪ Data are used for monitoring the implementation of the school's mission, vision and goals (2) <br> ▪ Data are used to monitor achievement (1) <br> ▪ Data are used to identify strong and weak aspects (1) <br> ▪ Data are used for defining new/strategic aims and objectives (2) <br> ▪ Data are used for cooperation with parents (1) <br> ▪ Data are used for improvement of educational purposes (2) <br> ▪ Data are used for communication and cooperation with other schools (1) <br> ▪ Data are used for planning school activities (1) <br> ▪ Data are used to improve the quality of education (1) <br> ▪ Data are used to improve the quality of teaching | ▪ Plan grouping of students based on intake data (1) <br> ▪ Monitor progress of individual students and groups of students based on assessment data (2) <br> ▪ Monitor the performance of teachers based on assessment data (1) <br> ▪ Identify weak and strong aspects of schools, teachers, and programs based on assessment data (1) <br> ▪ Develop interventions as needed based on assessment data (1) <br> ▪ Choose an appropriate program of teaching based on intake data (1) <br> ▪ Plan on modifications in the program of teaching to adjust to the needs of the class based on intake data (1) <br> ▪ Adjust lesson plans and goals according to needs of students based on assessment data (1) <br> ▪ Change the topics of lessons based on assessment results (1) <br> ▪ Present student achievement results to parents (2) <br> ▪ Monitor student progress based on assessment data (1) <br> ▪ Proof that the school improves based on assessment results (1) <br> ▪ Teachers use survey results to understand student needs and expectations, habits, preferences, interests and incorporates some of these elements in their courses (1) | ▪ Using assessment data for curriculum development (2) <br> ▪ Using attainment and performance data for placing students (1) <br> ▪ Using performance data and lesson observations for motivating staff (2) <br> ▪ Monitor and track student achievement based on performance, attainment and attendance data (2) <br> ▪ Evaluate and improve teacher performance based on lesson observations, performance data and internal inspections (3) <br> ▪ Based on Ofsted reports and achievement scores set new targets for departments (1) <br> ▪ Reward and motivate children based on data (1) <br> ▪ Policy development based on self-evaluation results, performance data, staff survey and Ofsted (3) <br> ▪ Improve lessons based on student voice data, observations (1) <br> ▪ Improve the school environment based on student voice data and parent surveys (1) <br> ▪ Targeted instruction for weak and strong students based on performance data (1) <br> ▪ Improve communication with parents on stakeholders based on statistics of the website (1) <br> ▪ Improve student behavior based on behavior, attainment and attendance data (1) |

*Note:   The number in the brackets represents the number of schools that identified each aspect.

Table 10 *Data and data system characteristics, organziation characterestics and user characeretics per country*

| Country | Data | Orgqanization | User |
|---|---|---|---|
| Germany | ▪ No pressure or sanctions to use inspection report (2)*<br>▪ (National) assessment data not always timely and accurate<br>▪ Final examination results not timely, accurate and valid (and not public)<br>▪ Teachers often have no direct access to student data (1)<br>▪ Administrative data are timely and of good quality, but no access for teachers (1)<br>▪ Collects a lot of data, but no systematic use (1)<br>▪ Data not relevant for instruction (1) | ▪ Challenge to find time/lack of time (2)<br>▪ No data expert (2)<br>▪ Evaluation tools available (1)<br>▪ No encouragement for teachers to use data (1)<br>▪ Lack of support in data entry (1)<br>▪ Lack of support in data analyses (2)<br>▪ Cooperation only around student performance report cards (1)<br>▪ Cooperation around data use depending on interest or data management (1)<br>▪ Clear vision and goals (1)<br>▪ No pressure to use data (1) | ▪ Belief in the use of data (2)<br>▪ Lack of statistical skills (1)<br>▪ Extra workload due to double data collection (1)<br>▪ Interest in use of valuable (centralized test) data (1)<br>▪ Experiences with qualitative data, but not with self-evaluation (1) |
| Netherlands | ▪ Lack of access to reliable, valid, accurate and timely data (6)<br>▪ Lack of alignment of different types of data (1)<br>▪ Information overload (2) | ▪ Lack of time (5)<br>▪ (Lack of) school leader support (3)<br>▪ (Too little) teacher collaboration (6)<br>▪ Data expert available (3)<br>▪ Need for training (5)<br>▪ Vision, norms and goals for data use (2) | ▪ Belief in the use of data (6)<br>▪ Lack of knowledge and skills (2)<br>▪ External locus of control (2) |
| Lithuania | ▪ Data not always timely (2)<br>▪ Relevant and accurate data (2) | ▪ Support of colleagues in the use of data (1)<br>▪ No data expert available (2)<br>▪ Lack of time (1)<br>▪ Clear vision and goals (2)<br>▪ Teacher collaboration around data (2)<br>▪ Need for professional support and training (2) | ▪ Belief in the use of data (2)<br>▪ Lack of knowledge and skills (2) |
| Poland | ▪ Reliable, valid, accurate data (2)<br>▪ Proactive in collecting different types of data (2) | ▪ Subject specific team meetings, focusing on analyzing student data (2)<br>▪ School leader request analyses of student outcome data and improvement plans (1)<br>▪ The school leader coordinates the work of the teams, provides structures, puts processes in place, participates in meetings, supports the development of an improvement plan, and monitors the implementation (1)<br>▪ School leader supports working with data on an every day basis (1)<br>▪ No structured process for data use and monitoring (1) | ▪ Belief in the use of data (2)<br>▪ Data use as an integral part of everyday work (1)<br>▪ Teachers are certified examiners who are able to assess and understand student assessment data (1)<br>▪ Lack of skills to use value added data (1) |

Table 10    *Data and data system characteristics, organziation characterestics and user characteretics per country (Continued)*

| England | | |
|---|---|---|
| ▪ Some assessment data not timely (4)<br>▪ Some data not available or accurate (2)<br>▪ Some data not reliable (4)<br>▪ Benchmarks sometimes change (1)<br>▪ Software difficult to understand (1)<br>▪ Each department can use their own data system targeted to their needs, besides the school wide system (1)<br>▪ Different tools available to analyze and use data (4) | ▪ Lack of money (2)<br>▪ Lack of time (2)<br>▪ Training available on data use and data systems (2)<br>▪ Data expert and/or manager is available for support (2)<br>▪ Collaboration around data use: discussion of performance data (2)<br>▪ Clear goals and vision (1)<br>▪ Support from the local authority in the use of data (1) | ▪ Belief in the use of data (4)<br>▪ Lack of motivation (2)<br>▪ Some staff lack of knowledge and skills, not all have the same level of competence (2)<br>▪ School staff have the knowledge and skills needed (2) |

*Note:*    The    number    in    the    brackets    represents    the    number    of    schools    that    identified    each    aspect.

## 4.    Conclusion and discussion

Based on the results described above, we developed the data use framework displayed in Figure 2. Before discussing this framework, we have to discuss the limitations of this report. First of all, the schools that participated by no means represent a representative sample. We want to emphasize here that the goal of this part of the project  was not to make firm generalizations, but to gain more insights into the use of data in different schools. The data were collected by interviewing teachers and school leaders in only a few schools per country. Teachers' and school leaders self-perception is used to study their use of data. We checked the comments made by the respondents by asking for more details and by asking for examples. Still, the data may produce a slightly colored or biased picture of the actual use of data within schools. However, because these results are in line with the results of several other data use studies, we feel confident to base our data use framework on the results of this study in combination with literature in the field.

In this framework, policy influences the enablers and barriers to data use, data-driven decision making, and stakeholder and student learning. Different aspects of a country's policy may be of influence. First, characteristics of the *accountability system* may play an important role. For example, the presence of an inspectorate (such as in England and in the Netherlands) and other forms of *external evaluation* (such as in Poland, Lithuania) may influence data use. Schools may perceive these evaluations as a form of *pressure.* Another form of pressure that is put on schools is the *public presentation of a school performance*, such as in England (in League tables), in the Netherlands (online and rankings that appear in newspapers and journals) and Lithuania (online). Moreover, schools in some countries, such as Lithuania, the Netherlands and England, are expected to engage in *school self-evaluations*, leading to additional data schools can use. Also, the amount of *autonomy* schools have in decision making can affect data use. In England and the Netherlands, schools have a lot of *autonomy*, and they can make almost all decisions (with regard to the curriculum, instruction, personnel and resources) themselves. In Germany, schools have a lot less autonomy. Furthermore, a policy context influences *the types of data* that are available. Some countries work with national standardized assessments (Germany and Poland) and/or national standardized examinations (Germany, Poland and the Netherlands). Other countries have no national standardized assessments or examinations (England). Finally, if a country offers training (and sometimes a reduction in teaching hours as a consequence of taking the training), it will influence the extent to which school staff are able to engage in effective data use.

As displayed in Figure 2, different enablers and barriers influence data-driven decision making. These factors have been identified based on the results of this study and by conducting an extensive literature review on data use and related fields (see for example: the special issue of the American Journal of Education, 2006, 112(4); Ikemoto & Marsh, 2007; Kerr et al., 2006; Visscher, 2002; Wayman, 2005; Wohlstetter et al., 2008, Schildkamp, 2007; Schildkamp & Kuiper, 2010; Schildkamp & Teddlie, 2008, Schildkamp, et al., 2009; Schildkamp & Kuiper, 2010 Vanhoof et al., 2009; Verhaeghe et al., 2009). The following factors are hypothesized to influence data use: characteristics of the school organization, data characteristics and user characteristics.

First, characteristics of the organization influence data-driven decision making. The following organization variables were found to influence data-driven decision making in the different countries (e.g. in some countries the lack of these variables hindered effective data-driven decision making, the presence of these variables promotes effective data-driven decision making):

- Structured time is set aside to use data and structured processes for data use to exist within the school (G, N, L, E, P) (Note: G, N, L, E, P refer respectively to the fact that this variable influenced data use in German, Netherlands, Lithuanian, English and Polish schools).

- The availability of a data expert who can provide the needed data in a timely matter, as well as assist in analyzing, interpreting, and using data (G, N, L, E)
- The availability of training: professional development in accessing, analyzing, interpreting and using data (G, N, L, E)
- Teacher collaboration: teachers collaborate around the analysis, interpretation and use of data, in for example subject matter teams, grade level teams of data teams (G, N, L, P, E)
- Vision, norms and goals for data use: the school has clear goals and visions, and data can be used to monitor the extent to which the school is reaching these as well as to come up with measures to improve, if necessary. Moreover, the school also expects school staff to use data on a regular basis and specific norms and goals with regard to data use exists (G, N, L, E)
- The school leader actively supports, encourages and facilitates (for example, by structuring time) data use (N, P)

Second, characteristics of the <u>data</u> influence data-driven decision making. Specifically, the following variables were found to play a role:

- Accessibility and availability of data and information logistics, for example through information management and other data systems. School staff should be able to find the data they need easily and timely. Data should be aligned, and school staff should not have to look into three different systems to obtain the types of data they need (G, N, L, P, E)
- The quality of data: schools need timely, accurate, valid, relevant, reliable data, which coincides with their needs (G, N, L, P, E)
- Tools, which support data analyses, interpretation and use (e.g. which can aggregate data, can calculate attainment and progress, adjusted to socio economic status etc.) (G, N, E)

Third, <u>user</u> characteristics influence data use. The following variables were found to play a role in the different countries:

- Attitude toward data: It is important that school staff believe in the use of data, that they think it is necessary to use data to improve their practice, and that they are motivated to use data (G, N, L, P, E)
- School staff need knowledge and skills to collect, analyze, interpret and use data (G, N, L, P, E)

The different enablers (if these variables are present) and barriers (absence of these variables) influence the extent to which data are used to base decisions on. We distinguish between three different types of data-driven decision making (although these sometimes overlap). First, the use of data can be used for <u>school development</u> purposes. In the case studies described above the following school development purposes were mentioned:

- Policy development and school improvement planning , based on areas of need and strong aspects (N, E, G, L, P)
- Teacher development (G, N, L, P, E)
- Grouping of students and placing students at school level (G, P, E)
- Monitor the implementation of the school's goals and, if necessary, (re)define aims and objectives/set new targets (L, E)
- Motivating staff (E)

Data can also be used for <u>accountability</u> purposes. The following accountability purposes were identified in the case studies:

- Public relations, to show the outside world how good the school is doing (G, N)
- Communication with parents (e.g. schools are accountable to parents) (G, L, P, E)
- Communication with other schools (L)
- To meet accountability demands (for example, self evaluation results are used as a basis in external evaluations) (N, E, P)

Lastly, data can be used for instructional development, such as:
- Monitoring progress of students (G, N, L, P, E)
- Adjust instruction (e.g. adapt instruction towards the needs of students, group students differently, determine the content of instruction, give students feedback, provide students with additional time etc.) (G, N, P, E)
- Curriculum development (P, E)
- Motivating and rewarding students (E)
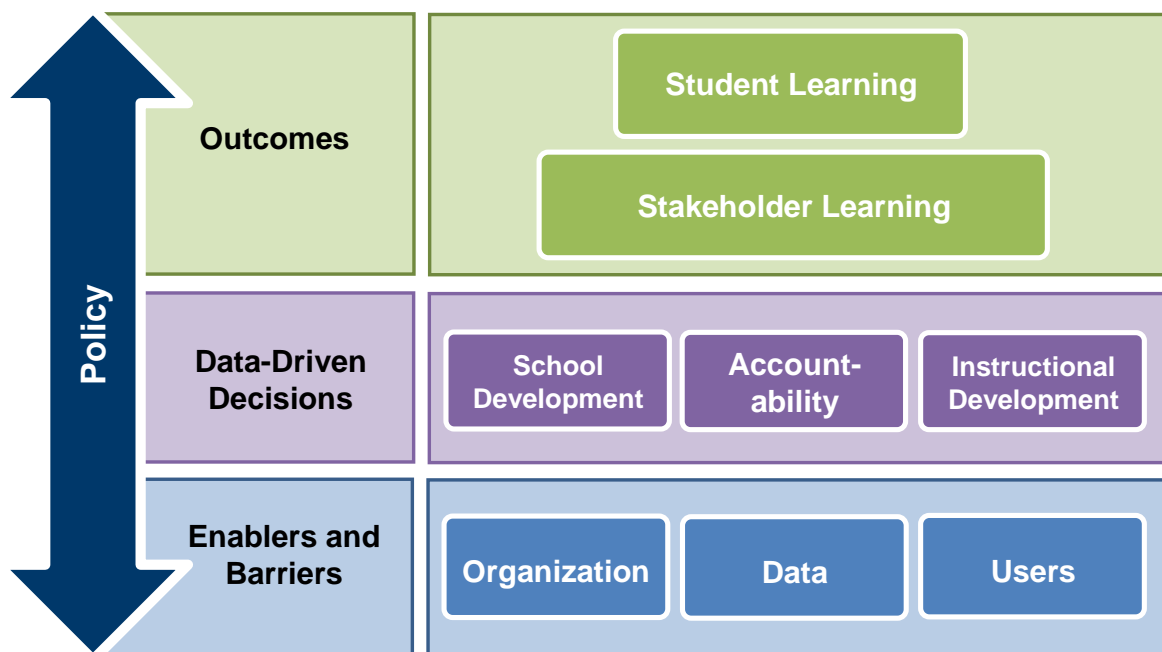


*Figure 2*     A data use framework

If data are used for these different purposes, this may lead to stakeholder (e.g. teachers, school leaders, parents) learning. For example, a teacher might decide to make instructional changes based on data (data-driven decision). This leads to improved instruction by the teacher (outcome: teacher stakeholder learning). Stakeholder learning in turn may lead to student learning (e.g. inquiry of students into their own learning and improved student achievement).

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## Appendix 1: Interview schedule for school leaders

We are working on a project concerning the use of data, such as assessment results and self-evaluation results, for school improvement. I would like to ask you a couple of questions concerning school improvement initiatives in your school and the use of data. When I talk about data I mean all the information that is available on the functioning of the school, including assessment data, self-evaluation results and inspection reports. The goal of our project is to support schools in the effective use of data. This interview will take approximately one hour. Before we start this interview, do you have any questions? Do you mind if I audiotape this interview? The results will be treated anonymously.

1. Could you tell me something about recent curriculum development or school improvement initiatives in your school?
   *Let the respondent speak freely, but probe if the questions below are not addressed, and ask for examples and illustrations. Also, ask about the use of data to improve student outcomes.*
   a. What is your role in these initiatives?
   b. Does the school use data in these initiatives? If yes, which data?
   c. By whom are these data being used?
   d. How are these data being used?
   e. For which purposes are these data being used?

2. Which data do you use in your job and how do you use these data?
   *Let the respondent speak freely, but probe if the questions below are not addressed for each data source mentioned by the respondents. Ask for examples and illustrations.*
   a. How are these data being used?
   b. How often do you use this type of data?
   c. For which purposes are these data being used?

3. a. I brought a list of different types of data (note: this list will be different for each of the countries), which might be available in your school. Can you tell me if these data are indeed available, if you have access, and if you use these data sources? *Some of the data sources may have already been addressed in question 2. You can skip these data sources. For the other data sources, ask if the respondents uses these. If the respondent uses the data, ask how, how often and for which purposes, if the respondent does not use the data, ask why not. Also, ask for examples and illustrations of use.*
   - School inspection reports
   - Annual inspection card on student achievement results of each department (offering an educational track) within each school location
   - Information in the annual school prospectus
   - Information in the annual policy plan
   - School self-evaluation results, including teacher and management questionnaires
   - Data on intake, transfer and school leavers
   - Final examination results
   - Assessment results

- Student demographic data
- Student questionnaire data and focus groups
- Parent questionnaire data and focus groups

b.  Did I miss certain data sources either you or your colleagues use? If yes, which ones? How do you use these data, how often, and for what purposes?

4.  a.  Do you receive any support in the collection, analysis, interpretation and/or use of data? *If the respondent is not able to answer this question, you can give some hints by asking if the school board encourages the use of data, if data is discussed collectively in team meetings, if the respondent received any professional development in the use of data etc.*

b.  If yes, how and is this sufficient?

c.  If no, do you want support? If yes, what type of support?

5.  a.  Are there any barriers in the school that prevent the use of data? *If the respondent is not able to answer this question, you can give some hints by asking if the respondent thinks he or she has the knowledge and skills needed to analyze data, of he or she has enough time to use data, and if the respondent has sufficient access to data.*

b.  If yes, what barriers and how do these barriers prevent data use?

6.  Can you indicate whether or not you agree with the following statements and why:

a. We have too little money to use data effectively.

b. I have too little time to use data effectively.

c. I don't have access to the all data I would like to use.

d. We receive a lot of our data too late.

e. A lot of data are not accurate.

f. A lot of data are not relevant to my job.

g. I don't think it is important to use data in my job.

h. I need training in the use of data.

i. We are capable of improving our school without the use of data.

j. I encourage data use in my school.

k. We collectively use data in this school.

l. Our school has a clear vision and clear goals.

m. We use data to check if we are reaching our goals.

n. Our school has a data expert, which helps me in the use of data.

o. I have the skills and knowledge needed to use data.

This was my last question. Thank you very much for your time. I am going to write a short report based on this interview. I will send this report to you for confirmation. Again, I want to stress that these results will be treated anonymously.

## Appendix 2: Interview schedule for teachers

We are working on a project concerning the use of data, such as assessment results and self-evaluation results, for school improvement. I would like to ask you a couple of questions concerning school improvement initiatives in your school and the use of data. When I talk about data I mean all the information that is available on the functioning of the school, including assessment data, self-evaluation results and inspection reports. The goal of our project is to support schools in the effective use of data. This interview will take approximately one hour. Before we start this interview, do you have any questions? Do you mind if I audiotape this interview? The results will be treated anonymously.

1.  Could you tell me something about recent curriculum development or school improvement initiatives in your school?
    *Let the respondent speak freely, but probe if the questions below are not addressed, and ask for examples and illustrations. Also, ask about the use of data to improve student outcomes.*
    a.  What is your role in these initiatives?
    b.  Does the school use data in these initiatives? If yes, which data?
    c.  By whom are these data being used?
    d.  How are these data being used?
    e.  For which purposes are these data being used?

2.  Which data do you use in your job and how do you use these data?
    *Let the respondent speak freely, but probe if the questions below are not addressed for each data source mentioned by the respondents. Ask for examples and illustrations.*
    a.  How are these data being used?
    b.  How often do you use this type of data?
    c.  For which purposes are these data being used?

3.  a.  I brought a list of different types of data (note: this list will be different for each of the countries), which might be available in your school. Can you tell me if these data are indeed available, if you have access, and if you use these data sources? *Some of the data sources may have already been addressed in question 2. You can skip these data sources. For the other data sources, ask if the respondents uses these. If the respondent uses the data, ask how, how often and for which purposes, if the respondent does not use the data, ask why not. Also, ask for examples and illustrations of use.*
    -   School inspection reports
    -   Annual inspection card on student achievement results of each department (offering an educational track) within each school location
    -   Information in the annual school prospectus
    -   Information in the annual policy plan
    -   School self-evaluation results, including teacher and management questionnaires
    -   Data on intake, transfer and school leavers
    -   Final examination results
    -   Assessment results

- Student demographic data
- Student questionnaire data and focus groups
- Parent questionnaire data and focus groups

    b.    Did I miss certain data sources either you or your colleagues use? If yes, which ones? How do you use these data, how often, and for what purposes?

4.    a.    Do you receive any support in the collection, analysis, interpretation and/or use of data? *If the respondent is not able to answer this question, you can give some hints by asking if the school leaders encourages the use of data, if data is discussed collectively in team meetings, if the respondent received any professional development in the use of data etc.*

    b.    If yes, how and is this sufficient?

    c.    If no, do you want support? If yes, what type of support?

5.    a.    Are there any barriers in the school that prevent the use of data? *If the respondent is not able to answer this question, you can give some hints by asking if the respondent thinks he or she has the knowledge and skills needed to analyze data, of he or she has enough time to use data, and if the respondent has sufficient access to data.*

    b.    If yes, what barriers and how do these barriers prevent data use?

6.    Can you indicate whether or not you agree with the following statement and why:

a. We have too little money to use data effectively.

b. I have too little time to use data effectively.

c. I don't have access to the all data I would like to use.

d. We receive a lot of our data too late.

e. A lot of data are not accurate.

f. A lot of data are not relevant to my job.

g. I don't think it is important to use data in my job.

h. I need training in the use of data.

i. We are capable of improving our school without the use of data.

j. The school leader encourages the use of data in this school.

k. We collectively use data in this school.

l. Our school has a clear vision and clear goals.

m. We use data to check if we are reaching our goals.

n. Our school has a data expert, which helps me in the use of data.

o. I have the skills and knowledge needed to use data.

This was my last question. Thank you very much for your time. I am going to write a short report based on this interview. I will send this report to you for confirmation. Again, I want to stress that these results will be treated anonymously.

## Appendix 3: Case study results Germany

The Institute of Information Management Bremen (Andreas Breiter, Louisa Karbautzi, Angelina Lange)

**The education system in Germany**

**Organisational structure**

According to the German Constitution (Grundgesetz) Article 7 clause 1, the States (Laender) are responsible for providing education from primary to tertiary level (Kindergarten and Pre-K are subject to the municipalities). The Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) is mainly concerned with education research, educational planning, and cross-state coordination within the framework of the State Coordination Committee of Education Ministers (Staendige Konferenz der Kultusminister, KMK). Since 2006, the Federal Ministry has been concentrating on three core aspects: ascertaining the performance of the educational system in international comparison, reporting on the educational performance, and making general recommendations (source: www.bmbf.de).
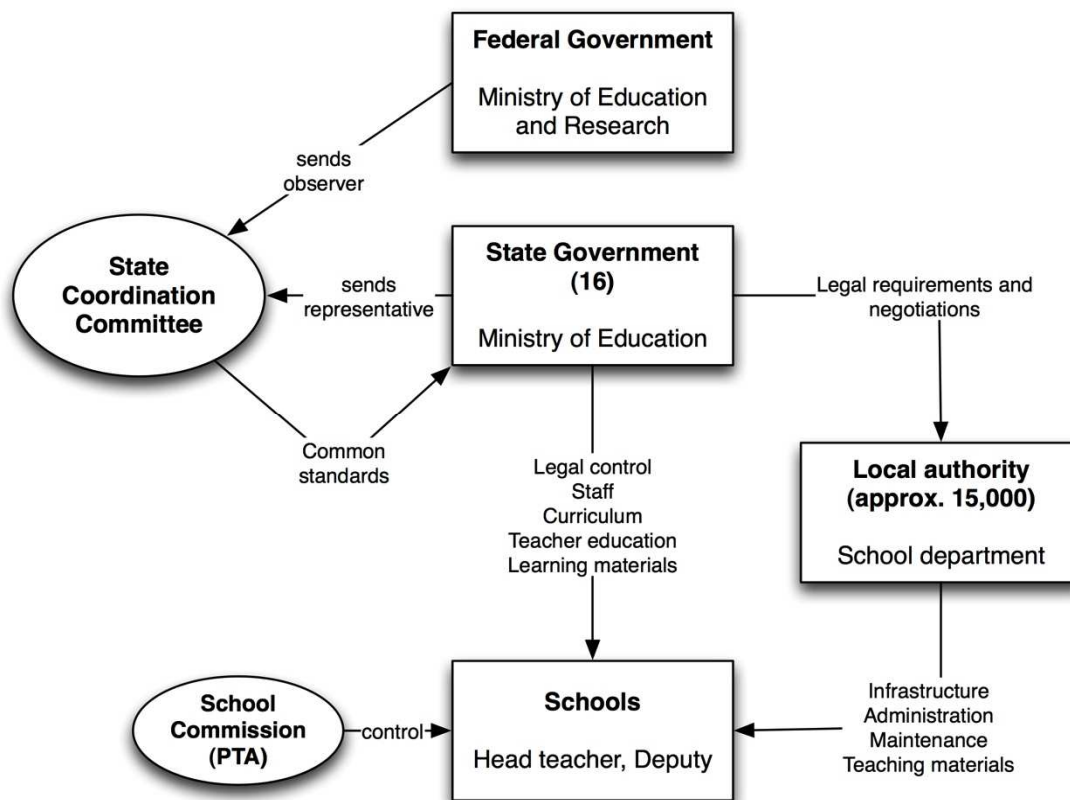


*Figure 1*     **The organisation of schools in Germany**

Within the States, the German schools are centrally organised with only limited autonomy of school management. The OECD study "Education at a Glance" identifies a decision autonomy in public lower secondary education of 30% at school level, while the decision autonomy at federal level is 4 %, at state level 31 % and at regional level 18% (OECD, 2007). That means that teachers are centrally distributed to the schools by the State. Head teachers are not in the position of leading the school in a managerial sense as they have to follow the bureaucratic principles of the State. Their budget autonomy is limited and they can neither hire nor fire teachers. In different reform initiatives, this role of school leadership has been challenged, but it remains very stable. The head teacher is also somewhat controlled by the school commission (whose role differs between the State legislations).

Additionally, the local education authorities play the most important role by providing the school's infrastructure. They are responsible for the facility management, administration, and IT infrastructure. Hence, we can identify a division into two different technological subsystems in schools: administrative and pedagogical.

After the "PISA shock", the BMBF started several initiatives to harmonise the curriculum in all the States. With the introduction of national education standards (for German, Mathematics and Science) in 2008 and their first assessment in 2010, State governments have operationalized those national standards into State standards. As this is a very new process, there is only limited research on compliance with the standards and their effectiveness. To support this change, the Institute for Quality Development in the Education System (Institut zur Qualitaetsentwicklung im Bildungswesen, IQB) was founded as a central institution for education research. Its goal is to perform educational monitoring: "The fields of work of the IQB are oriented towards operationalization, implementation and evaluation of cross-state education standards" (source: www.iqb-berlin.de).

**School supervisory board and school inspection**

In general, States employ a two-stage school supervision model. The upper school supervisory authority is the Ministry of Education, which shares its supervisory tasks with the lower (sometimes also middle) school supervisory authorities (i.e. school board, state school authorities) according to school types and/or regions.

The school supervisory board regulates internal issues by-laws and is responsible for the planning, organisation, steering, and supervision of the education system. Among others, they decide on the development of public schools, the regulation of compulsory education and class organisation, the content of courses to be introduced, as well as the right to exist of school locations. Hence, the boards examine the legal compliance on the one hand and provide consulting activities to promote school development on the other hand.

In the framework of supervision and as a reaction to PISA, school inspection was introduced as a new task of the school supervisory board in many, but not all States. School inspections are to be carried out by the school supervisory board in scheduled intervals. The results of the standardised observations concerning certain factors are recorded, analysed, and discussed with the school management. Together with the school, aims are (newly) defined and checked in a second phase. Thus, step-by-step, the school supervisory board shall take over a counselling role, as known from the British or Dutch education system. Comprehensive quality models have been developed by the States. They form the basis for determining the quality of the individual school.

Besides the central assessment of the national education standards, some States agreed on common student achievement tests in different grades and subjects. The participation varies and there is no single test that is issued in all 16 States. Additionally, States process their own student achievement testing systems. With few exceptions, there are central State-wide tests at the end of lower secondary school (10th grade) and at the end of high school (after 12th or 13th grade).

*Forms of evaluation*

**Internal evaluations**

In general, internal evaluations are not compulsory but school boards as well as other supportive institutions provide tools and support for schools. Progressive schools decided early on to adopt a model of working with internal evaluations – very often following the Dutch model.

In **Berlin**, with the help of the quality indicators formulated in the school programme, each school regularly checks the success of its pedagogic work by evaluation. The evaluation report includes:

- Presentation and evaluation of the statistical data of the school such as development of student numbers, school leavers, repeaters, students skipping a grade, and graduations
- Presentation and evaluation of examination results, school performance comparisons, school performance tests, orientation and parallel assignments as well as examination of students' backgrounds
- Analysis of evaluation results

Besides the evaluation of the work in schools, a plethora of self-evaluation tools on the subject of instruction and school management inquiries can be used.

In **Bremen**, the State Institute for Schools (Landesinstitut für Schule, LIS) provides the schools with a tool kit for voluntary self-evaluation on learning culture, school culture, and school management.

**External evaluations**

During a school inspection, the available reports and data of a school is analysed by the inspector team and summarised in a report. On the basis of this data, recommendations for school and instruction development are issued.

In **Berlin** a school inspection was established comprising the following areas:

- School results
- Teaching and learning processes
- School culture
- School management
- Teacher professionalism and personnel development
- Aims and strategies of quality development.

In **Bremen**, a school inspection similar to other German states has not yet been established. So far, the Bremen schools have only been examined once by an external institution. The school supervisory board and the schools conclude a target and performance agreement is needed concerning the work planning and the input of the school authority, which is periodically checked.

In **Berlin**, tests are carried out to ascertain the language level (Deutsch Plus) and the German and math skills of each child, so that an individual support can be ensured. Another examination of the student background in Berlin is carried out in grade 7 at the transition from the elementary to the secondary schools. The tests are held in German, math, and the first foreign language. The assignments are not marked; the results are processed individually. Additionally, all 3rd and 8th graders are tested in a cross-State student achievement test (VERA). Berlin has also processed a longitudinal study on the learning development concerning reading and math comprehension (ELEMENT) to identify developments in the grade 4 to 6.

In **Bremen**, there is a compulsory language level test (from the Netherlands, CITO) before school starts; the results serve for determining the promotion needs. Additionally, all 3rd and 8th graders are tested in a cross-State student achievement test (VERA).

School administrative data (enrolment, attendance, scheduling, etc.) is collected and processed individually in each schoolor the municipality (local education authority) provides a central software solution. The core data is regularly collected from schools for statistical reasons. In **Bremen**, every school has a local version of the school information system. In **Berlin** there is no standardized IT solution.

### Public presentation of school data

Most State ministries and/or local authorities centrally process selected school data electronically for so-called school portraits, which are made available to the public. In **Berlin**, the information system contains statistics and context data of all schools of the State on the following subjects:

▪ School
▪ Students
▪ School staff
▪ Technical resources
▪ School programme
▪ Model and school trials
▪ Management and professionalism

At present, a similar school data sheet for schools in **Bremen** does not exist.

### Pressure and support for the use of data

In **Berlin**, every school has to deal with the results from school inspections. The legal framework enforces them to check the targets and performance agreements. How this is processed internally is unknown. In **Bremen** schools, teachers are not obliged to deal with data, although it is expected by the school's supervisory board.

Support for data use is provided by the respective State institutions and by the school supervisory board. This includes process consulting and online provision of manuals, materials, and notes.

### Types of data available: what types of data are (theoretically) available in your country?

▪ **External evaluation reports** are prepared by the school inspection authority, they are not published.
▪ **Internal evaluation reports** are prepared individually by schools, they are not published.
▪ **School administrative data**: In Bremen, available and standardized (Magellan), in Berlin different solution.
▪ **Student outcome data:** results of the national assessment after grades 3 and 8
▪ **Attendance data, graduation data, mid-term and annual school assessment data:** available at school level.

Table 1      *Summary of Policy context*

| Country: | Germany | Bremen | Berlin |
|---|---|---|---|
| **Accountability** | National education standards | Tests (K-1, 3$^{rd}$, 8$^{th}$) | Tests (K-1, 3$^{rd}$, 8$^{th}$) |
| **Internal and external evaluation** | Differs between States | External: limited inspections Internal: not compulsory | External: inspections Internal: yes |
| **Pressure and support** | None | None | Few |
| **Types of data** | Student outcome data | Administrative data, achievement test results | Administrative data, inspection results, achievement test results |

*Method*

**Schools and respondents**

Due to the federal structure of Germany, the pilot schools should be located in two different States thus showing the differences between the respective education systems. These schools were selected with the help of the State-wide support organisations, which are responsible for quality enhancing measures. The schools should have experience with data usage and be interested in an international exchange.

The group of teachers we interviewed in **Bremen** were randomly selected by the head teacher and consisted of two male (currently teaching grade 5 and 6) and two female teachers (currently teaching grade 5 and 7). One of the female teachers is going to be the data coach in **Bremen**.

In **Berlin**, we interviewed two female teachers, one of which is also employed at the ISQ (Institute for School Quality in Berlin and Brandenburg e.V.) and will be our local data coach. For our school leader interview, we talked to 5 members of the school management (1 male, 4 female).

Table 2      *Schools and respondents*

| | Educational track(s)* | Number of students | Number of teachers interviewed | Number of (assistant) school leaders interviewed |
|---|---|---|---|---|
| Bremen | comprehensive school** Grades 5-12/13 | 570 | 4 | 1 |
| Berlin | comprehensive school*** Grades 1-12/13 | 1050 | 2 | 5 |

*Note:* * Comprehensive schools (Gesamtschulen) in Germany have very different modes of implementation. Depending on the State, the schools cover all different educational tracks with one common approach, others just cover the three different tracks (Hauptschule, Realschule, Gymnasium) under one roof; ** The school type in Bremen is Oberschule; *** The school type in Berlin is Gemeinschaftsschule.

**Interviews**

The interviews were held along the guideline. Unfortunately, the school management in Berlin were unavailable for half of the planned interview time (60 min.), therefore the interview had to be shortened. As compensation, the head teacher took part in the interviews with the teachers for an extended period of time. As a negative side effect, the teachers did not talk openly about their data use during this time.

**Documents analysis**

- School quality plan from the federal States Berlin and Bremen
- School brochure from Bremen school
- School Development Plan from Berlin school
- Instructions for creating a school development plan in the State of Berlin
- Data protection act for Berlin schools
- Logbook (student performance monitoring)
- Certificate form (Student performance report card)
- School feedback for national assessment VERA 3 and VERA 8

**Results**

**Results per school**

*Bremen*

Data use by school leaders was limited in Bremen. Significant data has been collected since the new management team was hired, while most of them have not been dealt with systematically, yet.

The school management keeps track of statistics concerning applicants, incoming students, and school leavers to determine the popularity and success of the school's pedagogical programme. National achievement and school wide assessment results are used to evaluate teacher's performance, but no specific instructions or targetable improvement values have been formulated from the results. Recently, a questionnaire tool (IQES) has been aquired for self-evaluation purposes and also made available to the teachers. All evaluated data such as student numbers, test results, school programme etc. are usually forwarded to the staff and discussed during staff meetings. The statistical enquiries of the superior education authorities and the time required to collect the corresponding data are often not considered to be appropriate.

The use of data by teachers in Bremen was also somewhat limited. They use assessment results to monitor student progress and to determine the need for individual student support or instructional changes. Those results are usually discussed in subject meetings. The teachers use individual solutions to monitor their students' progress: written notes, digital tables, student learning diaries, old student performance report cards, etc. Data on attendance, homework, assessment results, and general behaviour are collected for each student. Aside from the attendance which is recorded in a class register, the form of data collection is left to the teachers. Most use paper-based lists, some have found digital table-based solutions which they share with some others. The student learning diary, a means to keep track of individual homework and learning goals as well as to communicate with the student's parents, is not widely used by the teachers. A new edition with more space to record the student's progress has been ordered and will be distributed soon. Some teachers also use the semi-annual student performance report cards to compare student progress. One teacher has started to self-evaluate her teaching styles with short paper-based student questionnaires. Possible explanations for a lack of data use includes a (perceived) lack of time, lack of teacher collaboration, and lack of advanced data analysis and use skills.

*Berlin*

An action-oriented data use by school managers could be stated only to a limited degree in the Berlin school. A lot of different data is collected and analyzed. The discussion is limited to the inspection of the evaluation and a presentation in the staff meetings. If the evaluation shows weaknesses in certain subject areas, the management considers how and where these can be compensated.

New pedagogical concepts are evaluated (e.g. by external process monitoring) and improved during the process; here performance data of the students is only a minor role.

Context data of the students is not considered for data analysis. It only serves for controlling the central input of the resource of teachers' hours.

As the results of the final exams are available too late, they cannot be used for planning or restructuring teaching processes.

The statistical enquiries of the superior education authorities require much data collection work, which is often not considered appropriate.

The data collection for the national learning performance measurements is carried out in the school and is very error-prone resulting in low quality data.

One barrier to data use is the different information systems which are not compatible, preventing the continuous monitoring of student performance. The strong data protection regulations of the Berlin Senate impede the digital storage of performance and context data.

For their teaching, the teachers mainly use performance data they collect themselves; they ascertain the performance progress of the students themselves and deduce respective measures.

The monitoring of student performance is carried out according to the new pedagogic concept, standardized in the logbook. It includes the subject dealt with, the weekly plans of the students, but also the so-called certificates judging the student performance. Therefore, the teachers collect the qualitative (textual) evaluation of their colleagues and deduce learning targets, which are disclosed to the parents. A standardized student feedback to judge teacher performance has not yet been established.

The teachers can introduce their teaching experiences in the school development process; they collaborate in expert groups and induce further development, but unfortunately without deliberately using data. Anotherbarrier to data use is the lack of time and not the lack of access to relevant data are mentioned. Use skills are considered adequate, but the question is whether all possibilities of data use are known.

## Results of the cross case analyses

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| Oberschule Helgolander Straße, Bremen | <ul><li>school inspection report</li><li>school information brochure</li><li>school policy plan (write-up, no targetable values/data)</li><li>self-evaluation results (management questionnaire)</li><li>administration data (intake, school leavers, class lists, absentees, contact data)</li><li>student demographic data</li><li>assessment data (results of diagnostic tests in Math and German,</li><li>achievement data and national tests (VERA 8))</li><li>student performance report cards</li><li>final examination results</li></ul> | <ul><li>school inspection report should be relevant for school improvement (T1), but in reality no pressure or sanctions by the inspectorate (SL)</li><li>school policy plan available and public but is not updated (SL/T1-4)</li><li>central solution for administrative data; timeliness, quality and security ensured (SL); not official access for teachers, only paper based (T1/T4)</li><li>assessment data is not always available timely (T1)</li><li>diverse, individual forms of collecting various achievement data by teachers (analogue/digital) (T1, T3)</li><li>half-standardized student performance report-cards; no marks until 8th grade (SL)</li></ul>hybrid data collection; daily: analogue, semi-annually: analogue + digital (T1-3, SL) | <ul><li>challenge to find enough time to work on data (SL, T1-4)</li><li>no data expert (T) vs. tool expert (on sabbatical) and data and system assistant (SL)</li><li>use of data is encouraged by providing evaluation tools (SL) vs. teachers don't feel explicitly encouraged (T1-4)</li><li>lack of support in analyzing data professionally (T1, SL)</li><li>collective use or discussion of data only for student performance report cards or "important" data (e.g. self-evaluation, national tests)</li></ul>no collective use | <ul><li>general belief in the use of data (SL, T1, T4)</li><li>lack of skills in statistics to interpret results (T1, T4); no professional knowledge (SL)</li><li>only willing to put time and effort for the collection/evaluation of valuable data (SL)</li><li>interested in utilizing centralized tests (T4)</li></ul>unsatisfied by double data collection workload (T1, T2, T3) | <ul><li>policy development:/ planning: data are not used for, but generated during the development (e.g. management questionnaire results)</li><li>evaluating teacher performance: assessment data are used to track development</li><li>reporting to the administration: assessment data and administrative data</li></ul>public relation purposes: administrative data/statistics (D) | <ul><li>instructional changes: assessment results (T4), individual self-evaluation (T3)</li><li>individual student support/forming of learning groups: assessment results (SL), student learning diary, house call reports (T1, T2)</li></ul>monitoring progress (for student performance report cards) and identifying areas of need: assessment results, entries in personal notes (T3) and student learning diary (T3, T4) |

*Continued*

| | | | | | |
|---|---|---|---|---|---|
| Walter Gropius Schule Berlin | ▪ school policy plan<br>▪ school inspection report<br>▪ assessment data<br>▪ achievement data (results of national, local and diagnostic tests)<br>▪ final examination results<br>▪ administration data (intake, school leavers, class lists, absentees, contact data)<br>▪ student demographic data<br>▪ student performance report cards<br>▪ individual monitoring for student performance / behavior (Logbook)<br>Self evaluation data for pedagogical program | ▪ school policy plan is descriptive, actually and public, incl. project plan with indicators to be measured (S1)<br>▪ school inspection report should be relevant for school improvement (T1, S1), but in reality no pressure or sanctions by the inspectorate (SL1)<br>▪ National assessment (3 and 8 gr) data accessible standardized, but not useless, not timely and not accurate (decentralize data entry) (SL1)<br>▪ diagnostics test for all children (just) starting school, in upper grades selected only, not systematic but teacher-dependent<br>▪ final examination results not timely, accurate, valid (SL3)<br>▪ no central solution for administrative data;<br>▪ not official access for teachers, only paper based WinSchool, updates of data twice a year by teachers paper-based, central student register planned, student demographic data privacy problem (SL1)<br>▪ Context data: students with non-German background, digital for statistics and central resource planning<br>▪ half-standardized student performance report-cards; no marks until 8$^{th}$ grade (SL) digital and paper based for the parents<br>▪ student performance monitoring (Logbook), access for teacher and parents (T2)<br>reports, access for usage in staff meetings | ▪ Clear goals in school policy plan<br>▪ collect lots of data but no systematic use of results, no pressure to use them<br>▪ collective use or discussion of data depending on interest of grade management . (L1)<br>▪ no data expert in school, but connection to ISQ<br>▪ lack of support in data entry and analyzing data professionally (T1, SL)<br>external process evaluation of pedagogical projects | ▪ Experience with qualitative data<br>▪ no experience with self evaluation by teachers<br>▪ no time for data analysis<br>data are not relevant for instruction | ▪ for school improvement planning<br>▪ reporting to the administration: assessment data and administrative data<br>▪ public relation purposes: administrative data/statistics (D) interest in performance monitoring from 1 to 13, barrier: data availability and accessibility | ▪ Assessment for student performance measurement (L1)<br>▪ instructional changes: assessment results<br>▪ administrative purposes<br>▪ data for parent feedback<br>▪ monitoring for learning process<br>no self evaluation |

*Note:* Between brackets the data sources from which the evidence was derived can be found: evidence from school leader interviews (SL), teacher interviews (T), documents such as school plans, school prospectuses, and inspection reports (D).

**Conclusion**

The biggest deficit in Germany's school system according to data use by schools is a missing general strategy of the education authorities. As schools have only limited access to data and no real autonomy, the data-driven decision-making process is either done on a different level, or it is not done at all. Schools have to collect data and transfer it to the education authorities, which requires a lot of effort. But the data is not fed back to the schools and the decisions based on this data are not transparent.

There is a problem of interoperability between the different data sets. Hence, the relationship between different data cannot be analyzed. There are no processes in place, which support the workflow and the roles between the different institutions. If in place, the information systems are heterogeneous and teachers select their own tools, which do not fit into the central information systems. There are no data standards and the ICT infrastructure for administrative purposes in schools does not allow collaborative or individual data use.

We suggest, that questions of information logistics should be included in our model as this is a necessary (although not sufficient) condition for data use in schools, German schools in particular. And we should take into account the strategic level at the education authorities on local and State level of data use to support the schools.

## Appendix 4: Case study results England

SSAT (Phil Bourne), data collection by Eva Kunst (University of Twente)

*This document will explore the different data sources and tools used by schools. In the United Kingdom, there are clear differences in the approaches taken for data use in England, Scotland, Wales, and Northern Ireland. References will be primarily made in relation to data use in England with some reference to the other countries. England represents the largest country with the greatest number of schools.*

### Accountability

There are two primary motivating factors that encourage Data use in England. Since 1988, schools have been charged with statutory external evaluation by Ofsted, who use school level data compared to similar schools, to make judgments on the effectiveness of a school. Additionally, school performance tables or league tables are widely published through a range of media which allows the public schools and a range of stakeholders to make judgments of their work. These indicators are published via the internet, newspapers, and a range of media sources.

Currently, there are about 27 different data items that are published which include:

▪ The number of students on roll
▪ The percentage of students that make expected levels of progress between KS2 and KS4
▪ The percentage of students that attain government benchmarks in attainment
▪ Contextual value added judgment which is essentially a tool that ranks schools based on the value that they add whilst considering contextual factors

In addition to this data, there are also indicators that collated at a student level and are aggregated to create comparisons against the national averages. Here data including postcode, deprivation indices, registered as taking FSM, ethnic origin, and indicators of mobility and school transition are collated. Schools provide this data through linked Management Information Systems to our government at set times in the year. This data is matched against existing data through the use of either identical characteristics or the unique identified reference for each student (UPN: Unique pupil number). This data record contains a significant amount of information about an individual and is therefore treated sensitively. As there is a significant amount of data, efforts to use this appropriately have resulted in highly advanced tools that support schools in both evaluation and also target setting. RAISE on-line is provided as a tool that supports both the school and those that inspect its performance with information that allows comparisons against the national performance of groups and other indicators. Similarly, Fischer Family Trust provides tools that enable schools to make similar judgments to that of RAISE on-line (despite differences in the models used).

Fischer Family Trust (FFT) was a precursor to RAISE online with the intention to provide schools, through local authorities, with tools that would enable them to engage with performance data. To explain the differences between these tools is best achieved through understanding how they are funded and resourced. The FFT is a charity founded by Mike Fischer from RM who identified that schools needed to have better access to data about school performance. Within each country there are a number of administrative districts or local authorities that have historically taken responsibility for administrating school budgets and providing localized support and training. The FFT project provided a relatively low cost solution for them to encourage schools to both engage with data and to set aspirational targets for their students. FFT originally provided printed information sheets that used national data to devise data models that were then provided in a format for school use. Over time, this has evolved to database sharing and now an on-

line version that can be accessed by more colleagues at each school. The FFT project is widely used by schools in the UK.

In year 2005, the government decided that the use of data was important and through Ofsted commissioned RM Forvus to produce an online tool that could support schools in self-evaluation of data and provide information to their inspectors and Local Authorities about their schools. This project demanded significant training and support for schools due to its highly statistical nature and also the implications associated with the use and handling of student data. Due to the complexity of the analyses available and the comparisons against the national data set, schools frequently sought alternative data tools that presented alternative judgments of their work. In 2008, Ofsted published "Using data, improving schools" which outlined to schools that they had the responsibility to use their own data sets to appropriately self-evaluate.

Consequently many schools now widely invest in a range of different data tools that support the process of self-evaluation and also provide different evaluations of their impact when compared to national data models. Comparisons of data tools sought from the same core data set present different evaluations and wise schools rapidly learnt to choose which tools portrayed its performance most favorably.

As a result of the complexity of both FFT and RAISE online and work completed by Professor David Jesson (an associate director of the Specialist Schools and Academies trust), there was significant demand by schools to obtain a better understanding of Value Added methodologies. Professor Jesson had developed a transparent model that enabled schools to identify how well they were performing against other schools based on national outcomes linked to prior attainment at KS2. This model reduced the inert complexity of other models and enabled schools to take back control of their own data. This model has now been widely adopted by schools as a method for both evaluation and estimate creation.

Despite the success of Jesson's work and the robustness of KS2 test scores, many schools also use different commercial benchmarking tools such as CATS. Here schools feel that this creates a more consistent benchmark particularly as students have not been prepared for these tests. Such is the freedom of schools provided to schools, many also invest in a range of additional tools that enable them to assess whole school and classroom climates to support decision making. For example, some schools collate attitude to learning scores which can be used either at a classroom or individual level to support coaching and mentoring of students that are not sufficiently engaged in learning.

As the demand for information increased many schools evolved roles that specialised in the use and management of school data. Here these individuals were largely responsible for transforming many schools into organizations. Rapidly evolving, these organizations became data rich and information poor. These colleagues most likely have been provided with the role to manage the school's management information system. This school system is largely used to ensure that the school is able to collate and prepare statutory returns to the DFE (PLASC) and many schools invest much into adding data to this resource. However, this data is rarely used to inform practitioners or encourage their decision making. Despite this, there remains an appetite for schools to have access to more information rather than less. With this blended approach, today's best schools are open to using different tools for different purposes but are equally wise to keep their eye on the ball particularly in relation to national benchmarks.

**Internal and external evaluation**

Ofsted undertakes formal evaluations of schools and in preparation of this, many schools undertake a range of self-prescribed inspections and have a range of internal evaluations that largely follow the Ofsted framework. Prior to November 2010, this was largely assessed in conjunction with the use of a Self-Evaluation form (SEF) which encouraged school leaders to assess their school against a range of criteria. From November 2010, the current minister for education has suggested that this is no longer mandatory; however, Ofsted has suggested that the SEF is a useful tool for schools to understand how they meet the requirements of the inspection judgment. There have been some significant changes to the frequency of the formal inspection process with the intent that the inspection will have the greatest impact possible on school improvement and outcomes for children and young people.

There will be more frequent inspections for schools that are inadequate or satisfactory, and a longer interval for those judged good. Announcements in the current white paper (November 2010) have highlighted that schools which are deemed as outstanding, will no longer be inspected. There will be no more 'light touch' inspections and inspectors will be able to challenge and support weaker schools by visiting those that are not improving in-between their full inspections.

Having listened to the concerns of parents, who feared losing the ability to give their views to inspectors, we will not inspect without notice for routine school inspections. Providing they do not give cause for concern, better performing schools will be inspected once in a five-year period. Ofsted will use annual risk assessments, looking at how schools are performing and gathering information from parents, to help decide which schools are to be inspected each year.

Inspectors will spend more time in classrooms observing teaching and learning and the progress made by the different groups of pupils. They will look very closely at whether the school has the capacity to improve. Ofsted will give schools less than two days' notice of inspection, the vast majority having between one and two days, ensuring a balance between reducing pressure on schools and ensuring inspectors see a true picture of what the school is like from day-to-day for pupils.

Developed after discussions with parents and pupils, nationwide focus groups, nearly 1,000 headteachers and other professionals, the new approach was piloted for over a year and takes into account feedback from parents, schools, governors, inspectors, and local authorities.

Under the revised school inspection arrangements, inspectors will give particular priority to:

- Proportionality: the frequency of inspection will be proportionate to need;
- Promoting improvement: inspectors will make specific recommendations based on their diagnosis of the school's strengths and weaknesses;
- Evaluating the achievement and wider well-being of pupils as a whole and of different groups of pupils, and assessing the extent to which schools ensure that all pupils, including those most at risk, succeed;
- Evaluating learning and teaching: inspectors will spend a high proportion of their on-site inspection time in the classroom;
- Assessing how well schools promote equality of opportunity and how effectively they tackle discrimination;
- Checking schools' procedures for safeguarding, keeping children and young people from harm;
- Fostering the engagement of headteachers and schools' staff in the process of inspection so that they understand the judgements made;
- Gathering, analyzing, and taking into account the views of parents and pupils;

- Assessing how effectively schools work in partnership with other providers in order to promote better outcomes for pupils;

The emphasis on lesson observations, student voice, and the use of data for personalised target-setting are aspects we applaud. (Excepts from Ofsted news, Jan 2010).

**Pressure and support for the use of data**

Currently, there is not a mandated training programme that supports schools in the effective use of data. There are a range of training opportunities that are available but, schools need to purchase this support. Even in initial teacher training and our nationally recognised head teacher qualification there remains no formally embedded approaches for the use of data. Despite this, many schools have adopted training and support from the Data Enabler programme which provides training opportunities in a range of data models, national consultancy support, and the use of an on-line training tool which encourages wider participation in the use of core benchmark measures and a recognised approach for using data. This work has been more broadly researched through a Masters in research qualification with Lancaster University. Future work includes the accreditation of data managers; which is being completed in conjunction with Edexcel.

In relation to the pressures on schools for effective data use, these are largely external. Judgments are made about the performance of the school based on the data presented. Schools therefore, identify the importance of data and with support use this energy to make better use of this tool. This pressure is inadvertently driven as there is no legislation or mandate that such practice is required.

Types of data available: what types of data are theoretically available in the UK?

- Questionnaires (pupil, staff and parents perception. Internal and comparable nationally based on selective involvement- ie. Kirk Rowell)
- Lesson observation (Teachers are encouraged to participate in three formal lesson observations and frequently staff will be involved in more)
- Student attainment data (Key stages 2, 3, 4 and where applicable 5) Data at KS2/4 and 5 is centrally collected and distributed in an aggregated form.
- Attendance data
- Special needs eligibility
- Free school meals take up
- Ofsted inspection reports
- School development plans, curriculum schemes of work, lesson plans, and lesson resources
- Internal inspections
- Purchased external evaluations
- Administrative data collated through the management information system
- Activity and participation through the school's learning platform
- Estimates of attainment (FFT, Jesson, ALIS, YELIS, teacher prediction)
- School website or learning platform
- Media articles (normally shared in school reception)

Table 1        *Policy context data use England*

| Accountability | Published national data sets (League tables) |
|---|---|
| | OfSTED inspection reports |
| | Governance |
| Internal and external evaluation | Internal inspections using lesson observation, perception questionnaires, attainment, and achievement data. These evaluations are most frequently based around the Ofsted inspection framework. |
| | External inspections from external evaluation agencies are optional, however, Ofsted evaluations are mandated and the frequency of which is dependant upon the success of the school. |
| Pressure and support | External evaluation and nationally published data |
| | No national training in the use of data and many different approaches used. However, the Specialist Schools and Academies Trust does have programmes in place that support schools in this work. |
| Types of data available | Broad range of data tools used for a range of different purposes |
| | Our national student database and achievement and attainment tables make much of this information available in a systematic and largely accessible manner. |

## Results of the case studies

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| 1 (Harrop fold) | ▪ KS 2 data (SL1, Sl2, T3, T4)<br>▪ CATS (SL@, T3, T4)<br>▪ Results from primary school (SL2)<br>▪ List of class in the management information system (SL2)<br>▪ Attendance data (SL1, SL2, T1, T2, T3, T4)<br>▪ Performance results (SL2, T3, T2, T4)<br>▪ Quality assurance of Parents (SL1, SL2)<br>▪ Lesson observations (SL1, SL2, T1, T2, T3, T4)<br>▪ Estimates of attainment (Jesson, Yelis, FFT) (SL1, SL2, T1, T2, T3, T4)<br>▪ Progress from formal assessment (SL1, SL2)<br>▪ Ofsted inspection report (SL1, SL2, T3)<br>▪ Raise Online (SL1, T1, T3)<br>▪ Free school meals take up (SL1, SL2, T1, T4)<br>▪ Reading literacy test (SL2) | ▪ KS2 data is too late available or not available at all (SL2)<br>▪ Only Raise Online data is not accurate (SL1,SL2,T3)<br>▪ Teacher prediction from primary school is not reliable (SL2)<br>▪ Deprivation factors influences the estimates of attainment in a negative way (SL1, SL2)<br>▪ Two data releases makes the data not reliable (SL2)<br>▪ System on the use of data differs in each department and subject (T1, T2, T3, T4)<br>▪ Benchmark grade for C-pass changes often (T3). | ▪ Money makes a difference in working with data (SL1, SL2)<br>▪ Software is difficult to understand (SL1, T3)<br>▪ Time hinder (SL1, SL2, T3, T1)<br>▪ Lack of motivation from teachers (SL2) | ▪ Treat kids as adults when setting achievement targets (SL2)<br>▪ Strong belief in the use of data for improving and raising performance standards (SL1, SL2, T1, T2, T3, T4)<br>▪ Moving away from staff using data to children using data (T2)<br>▪ Change of the way of using data between KS3 and KS4 (year 7,8 and year 9,10,11) | ▪ Curriculum development: progress data from formal school assessment (SL1, SL2), KS2 data (SL2).<br>▪ Students are in the right place: KS2 data (SL1, SL2), estimates of attainment (Jesson, CATS) (SL1, SL2), students performance (SL1, SL2)<br>▪ Strategic use of data to influence staff's motivation: performance data (SL1, SL2), lesson observations (SL1, SL2)<br>▪ Clear vision and clear goals: Ofsted inspection report (SL1, SL2), Raise Online (SL1, SL2) | ▪ Track children's achievement scores: KS2 information (T1, T2, T3, T4), estimates of attainment (Jesson, Yelis, FFT, CATS): (T1, T2, T3, T4), attendance data<br>▪ Identify behavior: performance data (T1, T2, T3, T4), estimates of attainment (T1, T2, T3, T4)<br>▪ Teacher performance: lesson observations (T1,T2,T3,T4), internal inspections<br>▪ Targets for the department: Ofsted inspection report (T1, T2, T3, T4), Raise Online (T1, T2, T3, T4), Faculty plans (T1, T2, T3, T4) |

## Results of the case studies *(Continued)*

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| 2 (Strood Academy) | • Proportion of time spent on subjects as proportion of the whole week (SL1)<br>• Rates on exclusion (SL1, SL2)<br>• Attendance data (SL1,SL2,T1)<br>• Numbers of teenage pregnancy (SL1)<br>• Performance data, captured every six weeks (SL1, SL2, T1)<br>• Attitude to learning survey (students) (SL1, SL2, T1)<br>• Curriculum / School plan (SL1, SL2, T1)<br>• Performance & Salary from staff (SL1)<br>• Questionnaires from pupils, staff, governors or parents (SL1, SL2)<br>• Lesson observations (SL1, SL2, T1)<br>• Attainment data KS2 & KS4 (SL1, SL2, T1)<br>• CATS (SL1, SL2, T1)<br>• Special Needs data (SL1, T1)<br>• Free school meals take up (SL1, T1)<br>• Self evaluation (SL1, SL2, T1)<br>• Estimates of attainment (FFT, Jesson, Teacher prediction, YELIS, ALPS) (SL1, SL2, T1)<br>• Statistics on the website (SL1)<br>• Raise Online (SL1, SL2, T1)<br>• School prospectus (SL1)<br>• Student's voice data (SL1, SL2, T1)<br>• Staff attendance data (SL2)<br>• Data on transfer, leavers intake (SL2)<br>• Information from exit interviews (SL2)<br>• Informal teacher observations (T1)<br>• External evaluation (SL2, T1) | • Not using some estimates of attainment because of high costs (SL1)<br>• Not using estimates of attainment because they are influenced by deprivation factors. (SL1)<br>• Not using teacher prediction and free school meals a lot because it isn't reliable (SL1, SL2, T1)<br>• KS2 (primary school) data is too late to use it (SL2, T1)<br>• Benchmarking data is often late (SL1)<br>• Wrong data are in the system because the merger of two schools (SL2) | • A lot of training is provided inside the school (SL1, SL2, T1)<br>• Data manager is available to help everyone (SL1, SL2, T1)<br>• The competence of all staff in using data is not on the same level (SL1, Sl2)<br>• Performance data is discussed in staff meetings (SL1)<br>• Not enough time to use data (SL2, T1) | • Strong believe in the use of data to raise performance standards (SL1, SL2, T1)<br>• Staff doesn't believe sometimes that the use of data is useful for improving performance standards(SL2)<br>• Information on prior attainment from primary school is not often available on time (SL2, T1) | • Raising performance standards: attendance data (SL1, SL2), rewarding children that are doing well (SL1), lesson observations (SL1, SL2)<br>• Motivate students and set them on the right track: attitude to learning (SL1), performance data (SL1, SL2), KS2 data (SL1), CATS (SL1), attainment data on intake (SL2), student survey (SL1,SL2)<br>• Raising motivation and evaluating performance of staff: performance data and targets set on salary (SL1), parents survey (SL2), student survey (SL1)<br>• Policy development: results from self evaluation (SL1, SL2), student's voice (SL2) | • Raise performance standards from students: student results (T1), KS2 information (T1)<br>• Special educational needs (T1)<br>• Improve lessons: student's voice (T1), informal observations(T1), formal lesson observations (T1)<br>• Improve teachers performance: lesson observations (T1), parents survey (T1)<br>• Motivate students: KS2 information (T1) |

## Results of the case studies *(Continued)*

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| 3 (Campsmount Technology College) | ▪ Ofsted inspection report (SL1)<br>▪ Student outcomes and performance data (SL1, SL2, T1)<br>▪ Student's voice (SL2)<br>▪ KS2 information (SL2, SL1, T1)<br>▪ Attendance data (SL1, SL2)<br>▪ Exclusions (SL1)<br>▪ Parents questionnaire (SL2)<br>▪ Staff questionnaire (SL2)<br>▪ Curriculum observations (SL2)<br>▪ Estimates of attainment: FFT, ALPS, ALIS, Jesson (SL1, SL2, T1)<br>▪ Raise Online (SL2)<br>▪ Free school meals (SL2)<br>▪ Self evaluation (SL2)<br>▪ Statistics school website (SL1) | ▪ Not using some estimates of attainment on their own because of deprivation factors (SL2)<br>▪ IT is not always available (SL2)<br>▪ Some of the data is available too late (KS2, Raise Online) (SL1, SL2) | ▪ Attendance data and performance results are discussed during weekly team meetings (SL2)<br>▪ Some staff believe that data is only about numbers (SL2)<br>▪ Each department can use their own data system besides the school wide system (T1)<br>▪ Staff have enough knowledge about the use of data (T1) | ▪ Strong believe in the use of data for school improvement (SL1, SL2, T1)<br>▪ Clear goals and school vision (SL1) | ▪ Strategy and policy planning: Ofsted inspection report (SL1), performance and outcome data (SL2),attendance data (SL2)<br>▪ Track and target children: performance and outcome data (SL1), KS2 data from primary school (SL2)<br>▪ Improve the school environment: student's voice (SL2), parents survey (SL2)<br>▪ Intervene with children that are weaker or talented: performance data (SL1)<br>▪ Find good practices of teaching: performance data (SL2, SL1), Ofsted inspection report (SL1), curriculum observations (SL2)<br>▪ Improve teacher performance: lesson observations (SL2)<br>▪ Improve communication with parents and stakeholders: statistics on the website (SL1, SL2) | ▪ Track and target children: performance data (T1), attendance data (T1), KS2 data (T1)<br>▪ Improve teacher performance: Ofsted inspection report (T1), lesson observations (T1) |
| 4 (London Capital City Academy) | ▪ Historical data and trends on year 7 (SL1)<br>▪ School wide performance results (SL1)<br>▪ Raise Online (SL1)<br>▪ Information from the local authority (SL1)<br>▪ Qualification, background information, and hours teachers work (SL1)<br>▪ Attendance data (SL1)<br>▪ Students' behavior information "sleuth" (SL1)<br>▪ Attainment data (SL1)<br>▪ Review cycle of teacher performance (SL1)<br>▪ Learning walks (10 min) (SL1)<br>▪ KS2, KS4, CATS data (SL1)<br>▪ Homework monitoring (SL2) | ▪ Some data is available too late (SL1)<br>▪ Teacher prediction from primary school is not reliable (SL1)<br>▪ Does not use some estimates of attainment on independent basis because of deprivation factors (SL1). | ▪ Low response on staff questionnaires (SL2)<br>▪ Support from the local authority in the use of data (SL1)<br>▪ Data manager is in school and available (SL1)<br>▪ In school training on different systems (SL1) | ▪ Not all the staff has the same level of competence on using data (SL1)<br>▪ Sometimes problems with the believe of teachers on data use in education (SL1)<br>▪ Strong belief of data use from school leaders (SL1, SL2) | ▪ Improve the curriculum: historical data (SL1), school wide performance results (SL1)<br>▪ Improve students behavior: data on behavior 'sleuth' (SL1), attainment data (SL1), attendance data (SL1)<br>▪ Improve teacher performance: lesson observations (SL1), learning walks (SL1), Ofsted inspection report (SL1), information on background of teachers (SL1).<br>▪ Policy and strategy planning: staff survey (SL2), Ofsted inspection report (SL1) | - |

**Results of the case studies** *(Continued)*

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| 4 (London Capital City Academy) | ▪ Estimates of attainment: ALPS, Jesson, Alis, FFT, Yelis (SL1)<br>▪ Ofsted inspection report (SL1)<br>▪ Free school meals take up (SL1)<br>▪ Teacher prediction from primary school (SL1)<br>▪ Test / Questionnaire analyses on test item level (SL2)<br>▪ External evaluation (SL1)<br>▪ Indicators on deprivation based on postcode (SL1) | | | | | |

## Appendix 5: Case study results Lithuania

Modern Didactics centre (Daiva Daiva Penkauskiene and Lina Grinyte)

**Introduction and research questions**

Briefly introduce data-driven decision making in your country, the importance of this, and the research questions:

▪ **For which purposes are different types of data being used by school leaders and teachers in secondary education in the Lithuania?**

More systematic data collection and use in Lithuanian schools is connected with introducing internal evaluation or audit system in 1999, when Ministry of Education and Science prepared the first methodology for schools. This methodology was built on the Scottish model "How good is our School". First, this model had tasks **to change approach towards school governance** giving opportunity for school communities to change governance and administration practices, and **to strive for quality in education**. The new model was considered to be an instrument for **active participation of all community members** in school governance and decision making processes, transfer from traditional control function towards the delegation of responsibility, common decision making, and school activities improvement. Six schools participated in the test of this methodology. Systematical self evaluation of all schools as organizations started in 2002, all over the country.

Lithuanian education policy encourages an implement transparent quality evaluation system, so self-evaluation of schools is expected to contribute to this goal.

Self-assessment process schools have to answer to three main questions:
1) How we are doing?
2) How do we know about that?
3) What will we do further?

Self-assessment has 6 phases:
1) Preparation;
2) "Wide audit";
3) Analysis of the selected areas;
4) Accountability and information;
5) Planning;
6) Use of results for further activities and improvement.

Schools are evaluated on the following spheres:
1) Academical (formal) achievements
2) Learning process
3) Support for pupils
4) School culture
5) School governance

*Data collection and use of it is needed for external and internal audit procedures*
*(Self-assessment)*

The main reasons why self-assessment data is needed are the following:
- **Evaluation of a real, factual situation**. It helps to see what is happening at schools and provides data for decision making.
- **Information about status quo/ factual situations**. All members of the school community are able to understand situations by use of clear indicators and data based evidence.
- **Definition of priorities**. A School is enabled to decide what is important for it and direct all efforts towards prioritizing goals.
- **Encouragment for improvment.** Correctly identified and chosen self assessment criteria show direction toward what schools want to move and encourages them to improve activities in specific areas.
- ***Which variables promote or hinder data use by teachers and school leaders?***

Schools are encouraged to use data for their own community improvment. Such schools are considered transparent and effective, providing quality education. Self-assesment is an obligatory procedure and Schools can use either already prepared internal audit methodology by the Ministry of Educantion and Science or use their own system. Data is also needed for reporting official educational institutions, parents, and community members. Schools acknowledge and recognize the use of self-evaluation but, at the same time look at this process as time consuming, complicated, and not clear enough. They look at the results as unreliable and not objective, and at the ratio between self-evaluation and other school activities as not clearly defined. Schools need constant professional external support for self-evaluation implementation. Schools still lack the timing of learning, "incubation" period, and then preparation for self-evaluation; they don't always understand the meaning of data collection and evaluation, and don't always go in depth with collected data, keeping it on the surface trying to answer to the question "who we are doing?". The Teachers lack of knowledge and research competencies, make it difficult to interpret selected data and draw conclusions. In some cases, acquired theoretical knowledge are not transferred into practice due to the already mentioned reasons: lack of time, competencies, will, and desire to work on it regularly.

**Context**
Describe the following aspects of your countries context related to data use (textual and in the Table below):
- ***Accountability***
  External (required by the official educational institutions, statistics, etc.) and internal (required by the official educational institutions, parents, teachers and all community members) accountability is the main drive of data collection, analysis, and use at schools in our country.
- ***Internal and external evaluation***
  External Evaluation (audit) exercised by the National Agency for Schools Assessment and
  Internal Evaluation (audit) exercised by the school administration in co-operation with other teachers.
- ***Pressure and support for the use of data***
  The National Agency for Schools Assessment has prepared a concept of instruments used for schools self-assessment. This concept introduces terms of self-evaluation, theory, and practice of self assessment in Lithuanian schools; guidelines for self-assessment instruments development. The concept of instruments for schools self-assessment is built on following models: 1) Scottish and English models for school self-assessment; 2)

French schools assessment models as alternative to British model; 3) German and Austrian quality assessment and assurance models, original ones, easily applicable for schools; 4) US and other countries experiences.

Ministry of Education and Science developed Recommendations for Schools Quality Self-Assessment. This document describes goals and objectives of self-assessment, concrete steps/phases, data collection methods, types of data, and follow up activities after the self-assessment completed. Lithuania has developed various external support forms for a schools internal evaluation: prepared internal audit consultants group, published methodical materials, arranged trainings and conferences, prepared self-evaluation research instruments, and recommendations for schools.

- *Types of data available*
  - Questionnaires (for parents, pupils and teachers);
  - Observation, individual conversations, and interview protocols;
  - Pupils formal achievements results (grades per semester, end of the year, results of Matura exams);
  - Data on lessons and school attendance/non-attendance;
  - Data about special needs pupils ( in terms of needed social, psychological, physical, financial, and other help);
  - Reports from external agencies (police, children rights inspections, etc);
  - Schools strategic documents, curriculum, programmes, and lesson plans;
  - External audit reports prepared by external auditors;
  - Internal audit reports prepared by schools;
  - Schools administrative data included into general information system AIKOS; statistical data
  - Majority of schools have websites for external users with main data presenting school profile and reflecting school activities, achievements, etc.; and intranets systems used by school community's members with main data on individual pupils and class achievements, home work assignments, school attendance, information or/and/ letters for parents, and announcements.

Table 1      *Policy context Lithuania*

| Country: | LITHUANIA |
|---|---|
| Accountability | Schools accountability is laid in the Law of Education, more explicitly defined in the Ministry's Recommendations for use of Self-evaluation Instruments (2010) |
| Internal and external evaluation | External Evaluation (audit) exercised by the National Agency for Schools Assessment<br>Internal Evaluation (audit) exercised by the school administration in co-operation with other teachers. Both are obligatory for all schools. |
| Pressure and support | Provided by the National Agency for Schools Assessment, external experts. |
| Types of data | Questionnaires;<br>Observation, individual conversations, interview protocols;<br>Pupils formal achievements results;<br>Data on lessons and school attendance;<br>Data about special needs pupils;<br>Reports from external agencies;<br>School strategic documents, curriculum, programmes;<br>External audit reports;<br>Internal audit reports;<br>Schools administrative data; statistics<br>Schools websites and intranets systems |

*Method*
**Schools and respondents**

Table 2   *Schools and respondents*

|  | Educational track(s) | Number of students | Number of teachers interviewed | Number of (assistant) school leaders interviewed |
|---|---|---|---|---|
| Gerosios Vilties, Vilnius | Basic school (lower secondary | 1163 | - | 8 |
| Antano Vienuolio, Vilnius | Basic school (lower secondary | 964 | - | 7 |

Schools were selected according to an open call for partnership. An invitation letter was send to all basic schools in Vilnius. Basic school means teaching children from age 6 or 7 up to 14 or 15 years old. Two schools, Gerosios Vilties and Antano Vienuolio, both basic schools, responded at the requested time. First, contacts were made with the deputy directors of the schools. At the beginning, communication was maintained by electronic correspondence and phone talks, later on by direct contacts. After clarification of project aims, objectives, activities, and planned outcomes, a decision was made on the leaders' groups' composition. Deputy directors made their decisions about selection of PLC group members based on their experience working in internal audit groups at schools or their contribution (willingness to contribute) to the groups work. Coaches were selected according to two criteria: 1) English language proficiency; 2) Participation in data use work. We were encouraging deputy directors to take on this role by themselves, but they refused because of their limited English language skills. The majority of PLC team members already have some experience in internal audit (evaluation) activities at schools. They are different subject teachers.

Composition of Antano Vienuolio basic school team:
Two English language teachers, one math teacher, one information technologies teacher, one chemistry teacher, one history teacher, and one deputy director. Four of the team members are involved in an internal school audit group, headed by the deputy director.

Composition of Gerosios Vilties secondary school team:
one English language teacher, two primary school teachers,one information technology teacher, 2 deputy directors, one chemistry teacher, one math teacher.

**Interviews**
No changes were made in the interview structure or schedule. Some questions were unclear, so researchers had to rephrase them and ask additional questions. No special method was used for analyzing the results, just simple content analysis because of small number of respondents.

**Documents analysis**
All main documents, such as strategic plans, the curriculum, internal audit (or evaluation) results, examination results, etc.are open for public in school websites , but they haven't been analyzed accurately during this period.

**Reliability and validity**

Interview questions were sent in advance to schools before interviews started. Respondents had enough time to get acquainted with questions and to clarify any specific, questionable issues. On time for meetings was agreed one week before interviews started. Interviews were organized in schools, as requested by the schools. Each respondent was interviewed separately in a face-to-face meeting with a researcher. Individual interviews took 30-40 minutes. PLC members were not rushed, as interviews were organized at a time when they had no lessons. The atmosphere of the interviews were open and friendly. Each PLC team was interviewed during one day period; eight PLC members from one school and seven from another were interviewed during two days period.

**Results**

**Results per school (within case analyses)**

**School no.1. Gerosios Vilties basic school**

Data use in this school is understood in a wide variety: not only as material for internal and external audits (that obligatory for schools in Lithuania). Leaders claim using many data sources that help to evaluate not only the overall work of the school, but the personal input of all school members as well. Data used at the school included: analysis of internal school audit, lesson observations protocols, different reports, statistics on exams results, results of various surveys and research, strategic and action plans, statistical and other data about pupils. This data was useful for planning and assessing change in school activities, results for defining new aims and objectives, cooperation with parents, and improvement of educational purposes. The data is useful for communication and cooperation with other schools: participation in joint programmes, projects, conferences, organizing open lessons, and competitions among schools.

Leaders admitted that they evaluate data accurately , which is connected by research and carried out by external bodiesto produce results. Unfortunately, they are received too late in many cases: for example, results about primary school pupils come when they are already at the basic school level. Results of state exams after graduating from secondary school are of great importance and interest as they help methodical groups at school work more effectively, to plan corrections in education process activities.

Leaders say that they always feel and receive support from colleagues while collecting, analyzing, and interpreting data. The School does not have any professionally trained data specialists in place. Data is analyzed by different team members. Who is doing what is decided according to data character, nature in correspondence with teacher's professional strengths in one or another field, and sphere of interest. Summing up, leaders think, that school team lacks professional skills to work with data. They call themselves"self-educated", "self-taught" amateurs and see a lot of space for professional improvement. The School is aware of all available data, considers it important and useful, and acknowledges its importance for school improvement. However, not always have these skills been needed to interpret and use the data in the right way.

No hindering factors were mentioned for data use at the school. Leaders admit that it is a really democratic, open process, supported by all school community members.

**School no.2. Antano Vienuolio basic school**

Data use is orientated mainly for purposes of the internal audit and its results. Internal audit results are major drivers for planning school activities, strategic aims, and making improvements in school life. Not all data is considered equally important and used in the same way. All respondents acknowledged the importance of internal audit results in their school and personal lives, as school community members, and in their professional activities.

Leaders not only use internal audit data, but also findings such as results of pupils' academical achievements, demographical data, lesson plans, teachers, and parents' survey results. This data is used for lessons preparation, organization of class activities, parents meetings, and for organizing the work of methodical groups at school. Data use is observed in terms of real changes in school life.

Leaders say that they always feel and receive support from colleagues while collecting, analyzing, and interpreting data. The School does not have any professionally trained data specialists in place. Some of the team leaders say, that they have sufficient skills for data use in the mean time (having in mind internal school audit), but would like to get more professional support from specialists in the field. Support is desirable not in the form of training, but in the form of consultations, face-to-face meetings, and discussions. Leaders would like to get an outside look to their work, to data needed for an audit, and other data used in their daily work. Internal audits are part of school strategic goals and activities, which is why it is considered a very important reason for data collecting analysis and use. Internal audit results are used for evaluating on-going activities, improving them, and planning new ones.

No hindering factors were mentioned for data use at this school. Leaders admit that it is a really democratic, open process, supported by all school community members.

## Results of the cross case analyses

| School | Available data in the school | Data characteristics | School organizational characteristics | Data user characteristics | Data use by school leaders: purposes | Data use by teachers: purposes |
|---|---|---|---|---|---|---|
| 1(PLC1) | Data used at school: analysis of internal school audit, lesson observations protocols, different reports, statistics on exams results, results of various surveys and research, strategic and action plans, statistical and other data about pupils. | Data is available, relevant, and accurate but not all data arrives timely from external bodies, and so loses value. School seeks to get and collect valid and reliable data. | School has vision and mission which seeks to implement. At the beginning of every new school year ,leaders present plans and goals to all school community. All teachers pay attention and follow the rules, norms, and aims of the school. There are special groups created for special actions: methodical groups, surveys groups, audit's groups, and others. These groups analyze and work with data. | School administration and teachers agree about usefulness of various data. This school doesn't have a professional data user. They think that school team lacks professional skills to work with data. They call themselves "self-educated", "self-taught" amateurs and see a lot of space for professional improvement. School is aware of all available data at school, consider it important and useful, acknowledge its importance for school improvement, but not always have needed skills to interpret and use them in a right way. Data is analyzed by different people. Who is doing what depends on data character, nature in correspondence with teacher's professional strengths in one or another field, sphere of interest. | School leaders use data to follow how mission and strategy are implemented, to evaluate main achievements, to correct objectives and plans,and to identify strong and weak points. Data also useful for cooperation with partners, participation in programmes and projects. | Teachers use data for planning and assessing change in school activities, results for defining new aims and objectives, for cooperation with parents, for improvement of educational purposes. The data is useful also for communication and cooperation with other schools: participation in joint programmes, projects, conferences, organizing open lessons, competitions among schools |
| 2(PLC2) | Data used at school: internal audit data, results of pupils' academical achievements, demographical data, lesson plans, teachers, parents' survey results. | Data is available, relevant, and quite valid. Teachers don't complain about lack of data but there are difficulties with time because teachers not always are able to manage time for using and analyzing data. | School has vision and mission which seeks to implement. At the beginning of every new school year, leaders introduce school action plans and goals to all school community. School community members pay attention to audit's results and strategic plans. There are special strategical and working plans groups which members participate in school activity planning. | School hasn't professional data user but they are in need of such a specialist. At the moment, school team works like a team in using data. School leaders and teachers say that they always receive support from colleagues while collecting, analyzing and interpreting data.. Some of school team members say that they have enough skills for data use in the mean time (having in mind internal school audit), but would like to get more professional support from specialists in the field. | School leaders use and promote data for better quality of education process, better implementing of school mission. Audits' data are necessary for strategic planning and planning of activities. | Teachers are familiar with internal audit data and use it for developing quality of teaching. Other data are used for better planning of activities and implementing school main mission. |

## Appendix 6: Case study results Poland

PCG (Małgorzata Marciniak)

**Accountability**

**Background information**

In 1999, Poland decentralized the central government's administrative and financial power with regard to schools, as was consistent with Poland's overall decentralization drive. A strong belief existed across the system that the Ministry could not effectively manage its schools from a distance. Poland therefore specified critical decision rights at each level of education as follows: the Ministry sets the standards (e.g. curriculum standards, key priorities, reforms), the 16 regions inspect schools and provide pedagogical support; the districts control the administration and financing of secondary schools, while the municipalities control the administration and financing of primary and lower secondary schools. Lastly, at the school level, directors are able to choose which teachers to hire, while teachers can choose which curriculum to use from a pre-approved list of over one hundred private providers. Schools have autonomy to make decisions related to a school's overall performance; financing has to be secured from the local administration though. Poland monitors the progress of students by administering national assessment exams in grades 6, 9, and 12.
Source: How the world's most improved school systems keep getting better? McKinsey's report 2010.
http://ssomckinsey.darbyfilms.com/reports/EducationBook_A4%20SINGLES_DEC%202.pdf

**Supervision and Accountability**

The legal act of the Minister of National Education of 7th October 2009 on pedagogical supervision presents a new model of pedagogical supervision and accountability which lists three supervising tasks performed by supervising authorities. These tasks include:

1. **evaluation** of educational activities of schools;
2. **control** of compliance with law concerning didactic, educational, and care-related activities of schools, establishments, and teachers;
3. **provision of support** to schools, establishments and teachers regarding their didactic, educational and care-related activities, as well as other statutory activity.

The Pedagogical Supervision Act introduces 17 requirements which the schools are evaluated by. The following explicitly impose data analysis and data use on schools:

**Requirement 1.1:** Results of the test, lower secondary school exam, secondary school graduation exam, and exam confirming professional qualifications are analyzed.

**Requirement 2.3.** Educational processes are well-organized. Pupils' achievements are monitored in the school or institution. The school or institution analyzes the results of monitoring pupils' achievements and implements conclusions from these analyses.

**Requirement 4.1.** Cooperation in teams is applied. Teachers work in teams and analyze effects of their work.

**Requirement 4.2.** Internal pedagogical supervision is exercised. Internal evaluation is carried out with the participation of teachers' teams. Conclusions resulting from internal pedagogical supervision are used to introduce changes in the functioning of the school or institution and to develop the school or institution.

The Ministry requires that the schools analyze data for school improvement. Schools are held accountable for performing the data analysis during the external evaluation visits and an external evaluation report presents the information of how a school performed on a given requirement.

**Internal and external evaluation**

There are two types of evaluations conducted in Polish schools based on the Pedagogical Supervision Act:

1. **External Evaluation** exercised by a pedagogical supervision authority
2. **Internal Evaluation** exercised by the headmaster of a school or establishment in co-operation with other teachers.

**External Evaluation** includes:

1. collection and analysis of information on the educational activity of a school;
2. determination of the extent to which a school or establishment complies with requirements set by the Minister of National Education.

Those requirements refer to the four fields of activities of schools, i.e.:

1. effects of didactic, educational and care-related activities, as well as other statutory activities of a school;
2. processes present in a school;
3. functioning of a school in a local environment, especially in regards to the co-operation with the parents;
4. management of a school.

The requirements for schools do not include all the possible issues regarding the obligations of schools to pupils, students, and parents. They indicate strategic and priority tasks as specified by the Ministry so as to help schools plan their work and hint on the areas to take into account.

**The Internal Evaluation** is an examination of a selected area of a school's activity, as a result of which it plans its further activities according to the gathered and analyzed information. Providing headmasters and teachers with autonomy in respect to the scope and the method of implementing the internal evaluation enables the school to choose its own development path. It also ensures improvements arising from the students' and their local social needs. Pursuant to the intention of the regulation, internal evaluation is a team activity which enables mutual communication amongst all parties interested in the quality of a school.

With the new legislation on the school supervision the Ministry provides a new, crucially important task for the headmaster - creating teams of teachers in order to perform joint activities. The areas of internal evaluation in a school shall be identified by a team of teachers. This selection should be based on the discussions concerning school needs, and the conclusions from the external evaluations.

**Pressure and support for the use of data**

**Background information:**

In 1999, Poland made professional development voluntary and at the discretion of each individual teacher. Having decided that professional development should be voluntary, the Ministry of Education embarked on a two-pronged approach to encourage teachers to develop their skills. Firstly, the Ministry funded the creation of Teacher Development Centers (TDC) across Poland. The TDC's were managed by Poland's sixteen regions and were responsible both for diagnosing the training needs of their local teacher populations and for offering in-service training courses accordingly; these courses were taught by TDC employees, professors from regional Colleges of Education, or high-performing regional teachers. The decision to place the governance of the TDC's in the hands of the regions was heavily influenced by the government-wide decentralization drive in 1999. Secondly, Poland created a four-level teacher path with accompanying salary increases to motivate teachers to enrol in in-service training programs; their completion accelerated the teacher's progress in their career track. In addition to that, bonuses were awarded to high-performing teachers by the school directors, subject to the guidelines articulated by the various regions.

The professional development of teachers depends on the following:

▪ their own intention to advance in a given area,
▪ the school leadership and encouragement/drive, for example as part of the school's internal evaluation plan or an improvement strategy,
▪ TDC's promotion of a given area for teacher development,
▪ reforms which require new skills, forms of collaboration or expertise to work on new tasks in schools.

Source: How the world's most improved school systems keep getting better? McKinsey's report 2010.
http://ssomckinsey.darbyfilms.com/reports/EducationBook_A4%20SINGLES_DEC%202.pdf

**Pressure and support**

Pressure for the development of new competencies, skills, and practices in schools are made through the Ministry's reforms and new legislation which imposes on schools new approaches, methods of work, or organizational solutions.

Pressure on the use of data by schools has been made by the introduction of the following

▪ the Act on Pedagogical Supervision
▪ the system of national assessments after grade 6th, 9th and 12th
▪ the Value Added Model calculation for all lower secondary schools

The introduction of the new legislature is usually coupled with a system of trainings offered by the Ministry. The extent of the training however, is not sufficient and it requires a lot of ground work with individual teachers in schools organized by the headmasters and local/regional centers.

**Types of data available**

1. **External evaluation reports**. They are prepared by external evaluators and stored in an electronic format on the Ministry's website: http://www.npseo.pl/
2. **Internal evaluation reports** prepared individually by schools

3. **School administrative data.** The Education Information System collects administrative, student, and teacher aggregate data into one database which forms the basis for the Ministry to calculate the subvention for education. EIS is maintained by a unit within the Ministry of National Education – the Informatics Center for Education since January 2005.
4. **Student outcome data**: results of the national assessment after grades: 6th, 9th and 12th
5. **Added Value Model data.** They are calculated for all lower secondary schools since 2006.
6. **Attendance data, graduation data, mid-term and annual school assessment data** available at school level.

Table 1        Policy context

| Country: | Poland |
|---|---|
| **Accountability** | Placed on schools through an Act on Pedagogical Supervision of 2009. |
| **Internal and external evaluation** | Defined in the Act on Pedagogical Supervision. A list of 17 requirements the schools are evaluated by constitutes the basis and roadmap for the school's improvement plans. |
| **Pressure and support** | Pressure is exercised mostly through new legislation, support is delivered through trainings organized by the Ministry, however not sufficient |
| **Types of data** | External evaluation reports<br>Internal evaluation reports<br>School administrative data<br>Student outcome data<br>Educational Value Added data<br>Attendance data, graduation data, mid-term and annual school assessment data |

**Method**

**Schools and respondents**

Table 2   Schools and respondents

| | Educational track(s) | Number of students | Number of teachers interviewed | Number of (assistant) school leaders interviewed |
|---|---|---|---|---|
| School 1 | 15 | 380 | 6 | 1 |
| School 2 | 15 | 380 | 5 | 1 |

**Interviews**

The interviews were conducted in a form of a discussion structured by the questions of the interview templates. Sometimes the order of questions was changed to allow for the natural flow of a discussion. However, all questions were addressed.

**Documents analysis**

Please describe the documents you collected from each school.

The schools did not share any specific documents.

**Results**
**Results per school (within case analyses)**

PLC 1
Data is used in this school by the teachers of the subjects which are part of the external examination and by the school leader. The school makes use of intake data, diagnostic tests, internal school assessment data, educational value added data, external examination results from the primary school, and the external examination data at the end of gimnazjum.

The intake data and diagnostic tests are used to plan the grouping of students into classes and division of students into language groups based on their level of foreign language proficiency. The results of the external exam at the end of primary school and diagnostic tests are used to make decisions about the choice of the program and any necessary adaptations to it. Interim assessments of student outcomes serve as the basis for adaptations of instructional methods, teaching goals, and strategies. The school director requests that the teachers analyze the results of mock exams to improve the level of student preparation. Teachers, mostly individually, analyze the data and prepare improvement plans which they implement in their classes without any external support. They do not get into the process of collaborative analyses, diagnosis, and development of action plans aligned throughout the school. The teachers do not follow a protocol of observation of data, then developing hypotheses about the root causes to diagnose the them, but they immediately jump to the phase of taking actions which seem right to them. The school director checks if the teachers' improvement plans were realized by checking the topics of the lessons reported in the class registers. No systematic evaluation of the implementation methods of the improvement plans is done by the school leader. As such working with this data leads to the situation in which for the last three years "the conclusions drawn from the outcome data were identical each year". The teachers and the leader believe in the use of data, but they admit that their data literacy competencies are limited. They learnt the skills only through individual reading and practice based on their intuition and logic. No structured preparation for data use was offered or developed on the job. The tendency to jump to actions without appropriate observation and diagnosis phases is visible both in the school directors decision making process as well as the teachers' practices. The needs of the school in the area of data use include: improvement of data literacy skills, introduction of school processes which help to use data systematically and in a collaborative way, share thoughts, observations, and plan aligned actions. The monitoring and evaluation process needs to be more effect than process oriented.

PLC2.
Data use belongs to school's priorities. Both the director and the teachers recognize the integrity of teaching with analyzing the data as a way to measure effectiveness of their work and completing the school's mission. The school director requested all the teachers to complete the professional development courses preparing them for the roles of external examiners. This helped all the teachers working in the school understand the national curriculum standards and the methodology for their testing during an exam. They gained the data literacy competencies common for all the teachers in the school. This influenced the way they analyze data, make observations, and draw conclusions from the assessment data, both internal and external. Their teaching has also become more targeted at the standard requirements. Based on the conclusions drawn from assessment data they modify their instructional strategies, teaching topics, and methods. The school has a set process for working with data. Once the raw results are gathered, the individual teachers are sent the results related to the subject they teach. They formulate their own observations and send them to the team leader. Then the team meets to discuss the observed conclusions and discuss the reasons for the achieved outcome. Based on the diagnosis phase, the implementation plans are written in the form of a list of

concrete tasks to be done with clear ownership assignment. The school director does not check how the teachers worked towards achieving the goals specified in the improvement plans, she only checks the outcome of the process by entering the classes and administering short tests to check if the students have already improved in the areas identified for improvement. There is a clearly visible accountability system in place. Teachers know that the director will hold them accountable if the students do not perform well on the exams. At the same time, the atmosphere at work is pleasant as the teachers realize that the hard work they put into analyzing data and implementing the improvement strategies brings positive effects. The school director is very interested in analyzing the alumni's paths of further development, however, the school does not possess required data for such an analysis. Therefore, the school director is interested in developing a process and structures in school which would allow for gathering such data and their systematic analysis. The needs of the teachers and the director were specified as: framing the existing practices into a process and implementing it across the school in all subject areas, developing competences of working on problem identification, data analysis, hypothesis development, and action plans implementation in a more structured way.

**Results of the cross case analyses**

If the necessary conditions for data use (data quality, data capacity, and data culture) are in place, and data are being used to formulate policy, evaluate and design programs, guide practice, and place students appropriately, then increased student achievement will result. However, it does appear that for data use to have a profound impact on student achievement, data use must be sustained over time, take place systemically throughout all levels of the organization, and be focused on student outcomes.

## Data Use Theory of Action
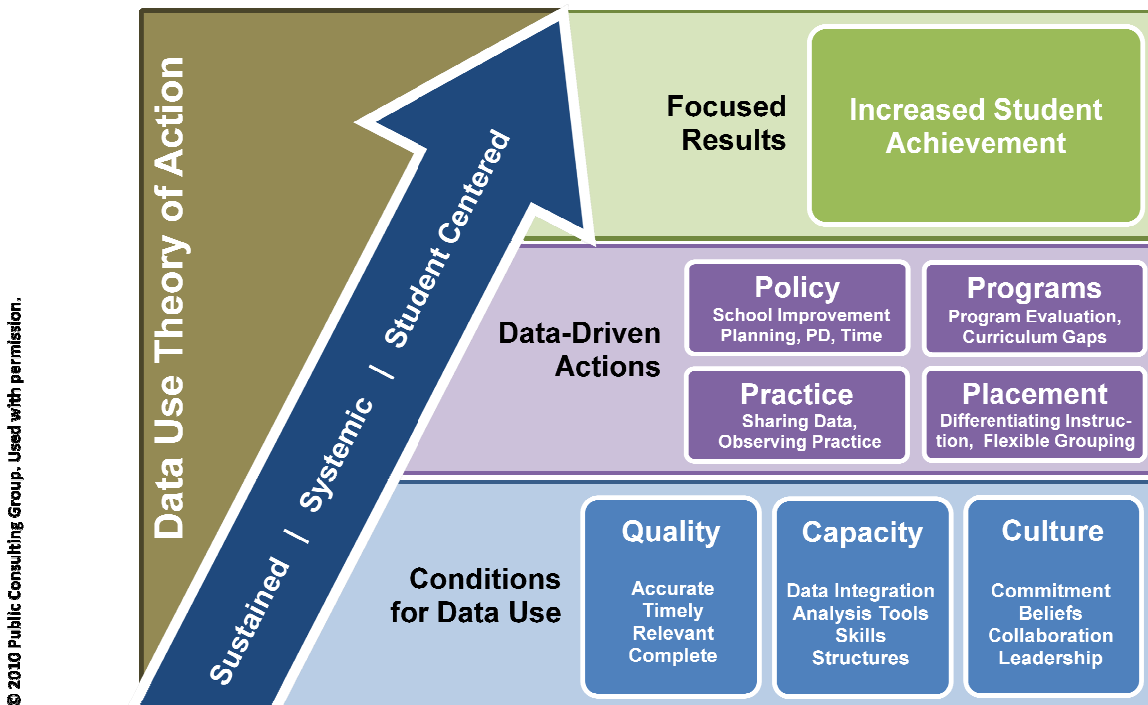
## Appendix 7: Case study results the Netherlands

The results of the case studies conducted in the Netherlands were previously published in:

Schildkamp, K., & Kuiper, W. (2010). Data informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26,* 482-496*.*

The reader is reffered to this article and to the summary in this report, regarding the results of these case studies.