Orienting School Culture and Operations Around Data

As a precursor to data-informed decision-making in any educational organization, the leaders and staff that compose those organizations must be committed to data as an important component of the programs they offer and an integral mechanism to ensuring the success of all the constituent groups and individuals they serve.[1] School leaders—and their staff—must begin by promoting and building consensus around the core belief that data are valuable resources that can ultimately reveal key insights about a given school's successes and challenges and guide actions, large and small.[2] Consequently, **school leaders should take concerted action to promote the value of data as an evidence base to inform their schools' and their own decision-making.**[3]

Defining a Culture of Data Use

K-12 leaders' capacity to use data for the intended purposes may vary depending on the presence of a culture of data use. A culture of data use results when an education organization commits to using data for continuous improvement at the school and classroom levels and embodies that commitment by emphasizing collaboration and empowering teachers and school leaders to make decisions for which they will be held accountable. To promote a culture of data use, leaders must set expectations with school staff and personnel to encourage data use in multiple areas of the school system. Developing a clear communication plan may help collaborations and partnerships. Ensuring that the data collected can be accessed easily and analyzed efficiently is also helpful. Finally, the data that are collected should clearly align with systems-wide goals.

Source: Regional Educational Laboratory Appalachia[4]

First, **school leaders need to build a shared belief in the power and value of data and schoolwide consensus around the importance of using data to inform educational programming and organizational operations.**[5] This means that school leaders must guide their staff in recognizing the utility of collecting and analyzing data as a means to refine their professional practice, improve student and systemic outcomes, and reduce the challenges they face in their daily work.[6] Indeed, school leaders should emphasize why and how various types of data can help their organizations and staff garner insight into what has or has not worked in the past, what is or is not working in the present, and what may or may not work in the future.[7]

Comparing Data-Driven Decision-Making and Decision-Making Without Data

Data-Driven Decision-Making	Decision-Making Based on Intuition, Tradition, and/or Convenience
• Focused staff development as an improvement strategy to address documented problems or needs	• Scattered staff development programs
• Budget allocations based on data-informed needs	• Budgetary decisions based on prior practice
• Staff assignments based on needs as indicated by data	• Staff assignment based on interest and availability
• Organized and factual reporting to the school community about students' learning progress	• More generalized reporting to the school community about events and notable outcomes
• Goal setting and action planning based on data about problems or needs and their possible root causes	• Goal setting and action planning based on group or individual preferences, political climate, or fads
• Staff meetings focused on strategies and issues raised by the school's data	• Staff meetings focused on dissemination of information and theoretical actions
• Grading and evaluation based on common performance criteria that report on progress toward established standards and expectations	• Grading and evaluation based on group or individual preferences and priorities regarding what behaviors and performances are important
• Administrative meetings focused on measured progress toward organizational goals	• Administrative meetings focused on operational mechanics and policy ideas

Source: Marco Learning[8]

Relatedly, **school leaders should emphasis the necessity of collecting and analyzing data and using data to make decisions in a variety of school improvement-focused practices.**[9] Data are essential for schools to determine current performance levels and outcomes, to set goals for future performance and outcomes, and to monitor and assess progress toward those goals.[10] Data also provide meaningful information to guide action planning and to evaluate the effects of in-progress and completed actions—which can further inform adjustments to practice and procedure.[11] Notably, such functions of data inherently support organizational practices such as *comprehensive needs assessments* (CNAs), *continuous school improvement planning* (CSIP), and *ongoing strategic planning*.[12]

Once school leaders build consensus around the value of data, **they should refocus on the more technical aspects of creating a data culture like the construction of norms and procedures, allocation of resources, and establishment of accountability measures to promote data-informed decision-making.**[13] This means working in tandem with division leaders to ensure that three key organizational traits are in place:[14]

- *Data infrastructure*: The creation and improvement of data systems are essential for collecting, transferring, and manipulating information. Linking distinct databases facilitates analyses that require connections across data types. Creating low-burden data collection mechanisms and certifying and monitoring data collectors also support data quality. Adjusting data access and management practices for timely delivery enhances the likelihood of data usage, and verification systems ensure data integrity.
- *Analytic capacity*: The ability of staff to create analysis plans and make sense of findings may require support and training. Relevant training topics might include implementing data practices, accessing and analyzing data, or data management and security. Technical assistance providers—either in-house or external—can conduct such training and offer additional insights. Likewise, improving accessibility of data supports capacity for data use.
- *Culture of evidence use*: Strong leadership and systems of accountability facilitate successful data use. For example, organizations may have formal policies requiring and monitoring data use, provide incentives for data use, or follow a strategic plan for using data. Promoting data sharing allows staff to reflect on data together and allocating time and resources for examining and using data encourages staff to do so.

Essential Elements of Data Culture

RESPONSIVE

Systems, policies, and practices support timely, in-the-moment iteration and can quickly evolve in response to the ever-changing needs of the end-user.

SUSTAINABLE

Individual capacity for and expertise in using data is developed and nurtured. Data are consistently embedded in dialogue and team habits at all levels and designed to weather persistent turnover in leadership.

PROMOTES EQUITY

Internally, there is an intentional effort to collect information representative of all stakeholders and identify areas of inequity or injustice. Individual and collective biases are named and neutralized. Externally, the power provided by information is eagerly distributed, especially with commonly disenfranchised populations by promoting transparency, dialogue, and shared decision-making.

USER-CENTERED

The organization embraces the mindset that data belong to everyone; therefore, data are easily accessed, understood, and used. Decisions about data are driven by the needs and priorities of the end-users rather than compliance and accountability.

HOLISTIC

Decisions about which data to collect and the extent to which the data are used are representative of the whole child, account for intellectual difference, and provide a comprehensive view of the factors shaping their education experience.

ALIGNED

There is a clearly articulated purpose for using data that guides decisions about what information to collect and how to use it.

Source: Education Elements[15]

Ensuring Collection of and Access to Relevant and Meaningful Data

As divisions and schools seek to establish the necessary data infrastructure to support data-informed decisions, **they need to consider conditions such as ease and volume of data collection, the utility of different data types that can be collected, and the ability of users to navigate, analyze, and draw insights from data.**[16] Specifically, school leaders—in collaboration with division leaders and other school community members—should carefully consider their school's existing data infrastructure (e.g., learning management systems, student and staff information systems) to determine whether adjustments are needed to ensure that they and their staffs can examine and act on data uninhibited by obstacles in functionality and access.[17] Likewise, school leaders should seek answers to the following questions to determine what the current data landscape at their organization looks like:[18]

- What types of data does our school currently have, and what data can we get if needed?
- What data will best help me as a school leader and my staff understand the problems we want to solve and/or the questions we want to answer?
- Do we need multiple data sources to understand these problems or answer these questions?
- What volume of data will be feasible to examine? What time or resources will be needed to collect, review, and analyze this data?
- How are these data collected and organized? Are my staff and I able to disaggregate data by specific demographic variables (e.g., race/ethnicity, socioeconomic status)?

Considering Users' Purpose for Collecting, Accessing, and Reviewing Data

USER GROUP	PURPOSES
Teachers	• Assessing the needs, strengths, progress, and performance of students • Developing and revising classroom instruction • Understanding professional strengths and weaknesses
School Leaders	• Assessing the needs, strengths, progress, and performance of staff and students • Developing and revising school plans, targets, and goals • Monitoring the implementation and impact of school practices, programs, and policies
Division Leaders	• Assessing the needs, strengths, progress, and performance of schools, staff, and students • Developing and revising district curricula, standards, plans, targets, and goals • Monitoring the implementation and impact of district practices, programs, and policies

Source: Regional Educational Laboratory Mid-Atlantic[19]

Importantly, **school leaders should ensure codification of procedures and guidelines for collecting, storing, and sharing data in all forms.**[20] While the specific procedures and guidelines may vary depending on the type of data to be collected (e.g., quantitative, qualitative), setting them is still essential to ensure uniformity in the quality and availability of various data to inform a range of school decisions.[21] In fact, school leaders should ensure that parameters are in place to collect the diverse array of data required to make informed decisions about all areas of school programming and operations (e.g., curricula and instruction, building maintenance, staffing, student support services, budget and resource allocations).[22]

Beyond the logistics of collecting and storing data, **school leaders should also ensure the specific data that are collected have clear purposes for their examination and are attached to specific strategic goals, organizational actions, and/or school programs.**[23] Doing so will further support ease of use by school staff and other community members, because the parameters and specific functions of different data types will be clear and evident for all groups and individuals engaging with data.[24] In particular, school leaders should work with the relevant division leaders and division and school staff to ensure that collected data are properly framed and cataloged, and thus more easily understood by users.[25]

Data Collection Methods for Schools

METHOD	DESCRIPTION
Surveys and Questionnaires	Surveys and questionnaires are used to gather qualitative information from large groups of school community members (e.g., students, staff, families). Collected data often include demographic information and information related to respondents' perceptions of and/or satisfaction with a given program, resource, and/or service. Schools administer surveys and questionnaires directly to individual respondents using electronic (e.g., email, web links) and/or print (e.g., paper forms) media. Survey questions typically ask respondents to select one or more answers from a specific response scale, though free-response items may be included.
Interviews and Focus Groups	Interviews and focus groups are most often used to gather detailed, qualitative descriptive data from participants (e.g., students, staff, families) regarding their backgrounds (e.g., demographics, experiences) and their perceptions of and/or satisfaction with a given program, resource, and/or service. Interviews are conducted one-on-one, while focus groups are conducted in small groups. Schools may conduct interviews and focus groups in-person or remotely using videoconferencing or phone. Interview and focus group questions are typically open-ended to allow for freedom in participants' responses, though questions are presented in a defined sequence and facilitators may ask follow-up questions as needed.
Observations	Observations consist of in-person visits and recordings of the implementation of specific programs and services (e.g., classroom instruction) or the use of a specific resource. Observations may be conducted by school personnel (e.g., principals, content area coaches) or external evaluators who seek to gather data around fidelity of implementation and the quality of programs, services, and resource deployment. Observations can be highly structured—with protocols for recording specific behaviors at specific times—or unstructured, taking a "look-and-see" approach. They are most reliable when they are conducted over a period of time to minimize the chances of the observation day(s) being atypical.
Tests and Assessments	Tests and assessments are instruments and/or procedures developed and used to measure, evaluate, and quantify the characteristics of programs and services and their resulting outcomes, as well as the performance of specific groups and individuals in exercising certain behaviors and/or applying specific knowledge. Examples include achievement tests and psychological tests (e.g., assessments of depressive symptoms and self-esteem). They may be standardized or created by those overseeing a specific program or service.
Document Review	Document review consists of those practices meant to compile records of specific actions (e.g., task completion, meeting notes) and to catalog non-performance-based variables (e.g., attendance, behavior, budgetary transactions, population demographics). In addition, document review encompasses the examination of such records as proof of the implementation of specific actions and for assessment of the impacts of those actions.
Secondary Research	Secondary research is the examination of documents and data that were collected by third parties but that may be useful for data-informed decision-making. Examples include statewide standardized test scores, community employment trends data, and empirical research studies on programs similar to those implemented by a given school.

Source: Harvard Family Research Project, Harvard Graduate School of Education[26]

Developing the Data Literacy of Leadership and Personnel

The effectiveness and efficiency with which school leaders and collaborative staff members make data-informed directly correlates with their individual and collective capacity to interpret data, develop theories around those factors driving specific manifestations of data (i.e., root causes), and research and develop actions based on available evidence.[27] School leaders—and educators more generally—must possess foundational knowledge of what data are, familiarity with the kinds of data

that are relevant to their specific professional duties, and refined analysis skills to draw insights from data to inform decision-making.[28] To promote such competencies for themselves and the staff working in their schools, **school leaders should offer targeted professional learning opportunities and facilitate ongoing job-embedded opportunities for themselves and their staff to develop and practice various data literacy competencies and to gain exposure to a variety of data types.**[29]

Organizational Competencies to Cultivate a Data-Driven Culture

DATA ANALYSIS

Leaders must provide training to build educators' data literacy to cultivate a data-centered culture in schools and districts and facilitate complex and action-oriented conversations about data.

DATA SOURCES

Leaders should help educators identify and evaluate different types and sources of data that could be collected to choose the most appropriate data source(s) to answer specific questions. This includes knowledge about the types of data resources currently available to a division or school (e.g., state standardized assessments, non-academic data, demographics data), as well as familiarity with disaggregation strategies that can ground the conversation in equity.

DATA COLLECTION PROCESS

Leaders should give educators clear guidance on how to identify and evaluate different types and sources of data that could be collected to choose the most appropriate data source(s) to answer specific questions. This includes knowledge about the types of data resources currently available to a division or school (e.g., state standardized assessments, non-academic data, demographics data), as well as familiarity with disaggregation strategies that can ground the conversation in equity.

DATA REVIEW

Leaders should establish procedures to help educators review data systematically (e.g., using data dialogue protocols, generating summary statistics) and interpret data to make inferences and decisions about next steps. This includes awareness about where to seek support, resources, or help with interpreting or understanding data.

DATA VISUALIZATION

Leaders should provide training and technical supports (e.g., technology) to help educators clean, sort, process, parse, and synthesize complex datasets to make patterns and trends more accessible, including generating data visualizations, particularly through the use of Excel, Google Sheets, or other data visualization software.

Source: Great Schools Partnership[30]

Professional learning activities should occur both in focused training sessions and job-embedded tasks (e.g., data teams), and school leaders should actively work to create the necessary conditions and provide adequate time and resources for such activities to occur.[31] Indeed, school leaders should allot time and resources to provide ongoing professional development on data literacy and data-driven decision-making—which will be further supplemented by continuous practical work in applying data literacy and data-driven decision-making to improve student outcomes and organizational performance.[32] Likewise, school leaders can take the following actions to model data literacy and data-based decision-making and promote their importance to school staff and other community members:[33]

- Take the lead on deciphering what data is important and how it is being collected and generated—and ensure that it is valid, reliable, appropriate, and high quality;
- Demonstrate the value of data for meeting goals by modeling effective data use;
- Embed data use into the jobs of diverse staff and reinforce goals, including using data to improve student outcomes, regardless of role;
- Gather and use student learning data, administrative data, and other classroom performance data to identify aggregate student needs and set goals for the school;

- Use teacher performance data to support classroom practice and improve instruction;
- Use data to foster a culture of constructive collaboration, collective responsibility, and continuous improvement;
- Provide ongoing, quality training on effective data use for teachers and school staff—including how to recognize valid, reliable, appropriate, and high-quality data;
- Create opportunities for adults in various roles to use data collaboratively to set and meet goals;
- Engage parents and the community in the story that data tell about the school, including both successes and challenges; and
- Prioritize the privacy, security, and confidentiality of student and adult information, and ensure that all adults in the school understand their responsibility to keep student information safe and use it appropriately.

Sample Professional Learning Resources on Data Literacy

Some state education agencies offer online professional learning materials that school leaders can reference to strengthen their own data literacy and as a resource to help teachers and staff working in their schools develop theirs. Two such resources are linked below.

- The Wisconsin Department of Public Instruction's **Data Literacy Module (accessible here)**
- The South Carolina Department of Education's **Data Literacy for Instructional Leaders series (accessible here)**

Source: Wisconsin Department of Public Instruction and South Carolina Department of Education[34]

As with any sequence of professional learning, school leaders should pre-assess their own data literacy and facilitate administration of pre-assessments to their staff to ensure that any activities are relevant and appropriate to the current proficiency levels of staff generally and as individuals.[35] Equipped with such knowledge of their own and staff capacity around data, school leaders can collaborate with internal and external experts to craft and ensure delivery of training and ongoing supports and coaching to help the larger school community better understand data and use it more effectively to guide decisions.[36] The main motivation is ensuring that ongoing support structures and training remain responsive to the larger schools and individual staff members' needs regarding their developing data literacy and capacity for data-driven decision-making.[37]

Sample Educational Data Sets

A school's specific data collection, warehousing, and visualization procedures determine what kinds of data leaders and staff can access and how those data are accessed and analyzed, making it important the school leaders promote familiarity with their organization's own data systems and processes. However, in an effort to build educators' data literacy and ability to make data-driven decisions, school leaders may also ask staff to practice their skills and knowledge using publicly available datasets and reports such as those available through the:

- **Virginia Department of Education (accessible here)**;
- **National Center for Education Statistics (accessible here)**; and
- **Organisation for Economic Co-operation and Development (accessible here)**

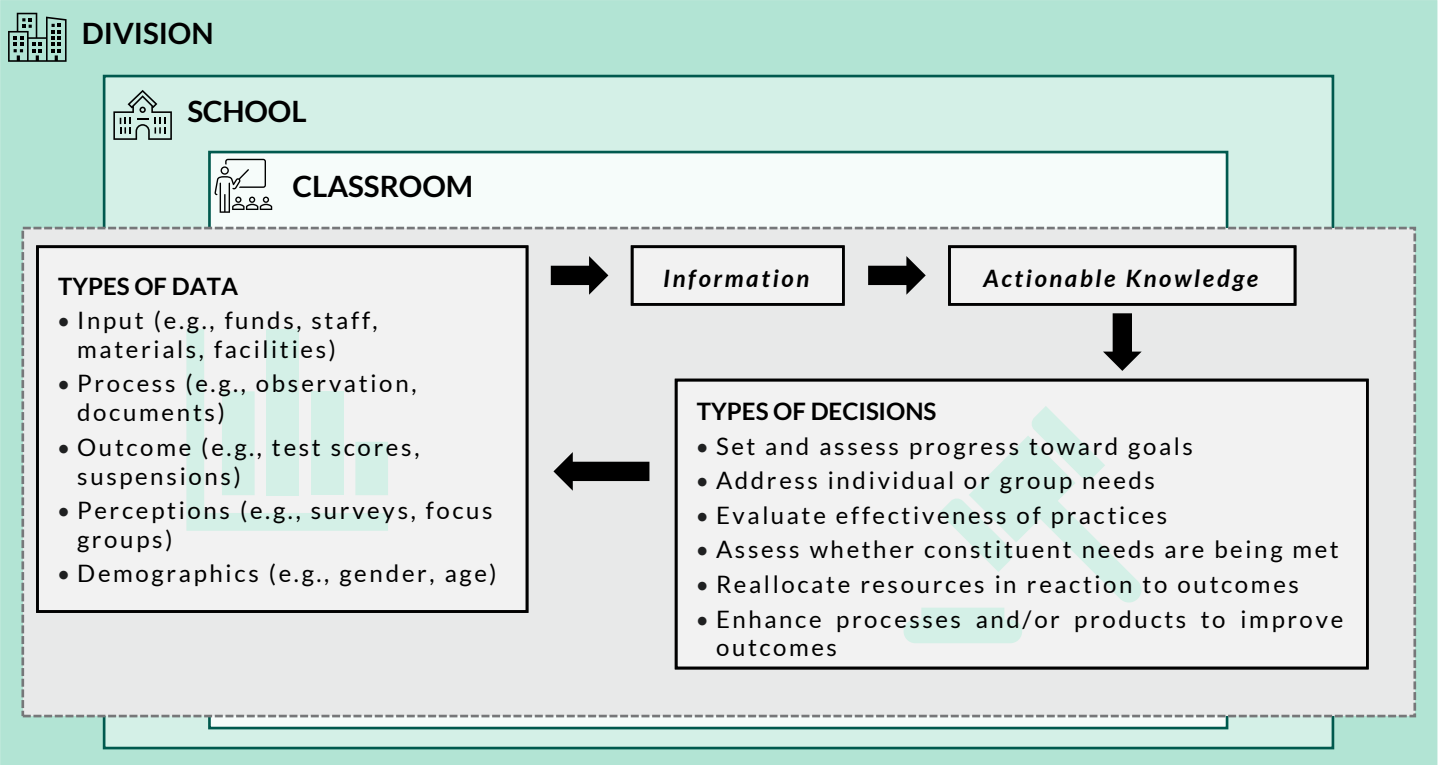
Source: Multiple[38]

Setting Protocols for Data-Driven Decision-Making

As a final step to facilitating data-driven decision-making, **school leaders should work with collaborating division leaders and division and school staff to develop and implement specific protocols and/or guidelines for how they and their school staff will collect, analyze, and make decisions based on data.**[39] Indeed, having set processes and expectations for how personnel working

in schools will draw insights from data to make a variety of decisions will ensure consistency in how decisions are made, reduce the cognitive burden on those analyzing data, and standardize organizational practices.[40] Developed or adopted data-based decision-making procedures will typically encompass a variety of elements such as what data to look at, how to analyze that data (e.g., questioning protocols, directions for disaggregating or organizing data by demographics), and the steps needed to make decisions based on those data (e.g., achieving certain thresholds of evidence, reaching consensus).[41]

Conceptual Framework for Data-Driven Decision-Making in Education



Source: RAND Corporation[42]

Notably, multiple frameworks and tools exist (and can be developed) to help school leaders and their staff implement data-driven decision-making.[43] For example, school leaders may advocate for a data-driven decision-making model that incorporates triangulation—the use of a minimum of three related data points to confirm a data-based finding and/or to create an evidence base upon which to make decisions (**as illustrated in the example materials available here**).[44] Additional examples include—but are not limited to—the following:

- The **Data Wise Improvement Process (information available here)** from Harvard University; [45]
- The **Five Steps for Structuring Data-Informed Conversations and Action in Education (information available here)** published by Regional Educational Laboratory Pacific; [46]
- The **Using Data to Inform Instruction process (information available here)** from the Great Schools Partnership; and [47]
- The **Plan-Do-Study-Act (PDSA) Cycle (information available here)**—which has been adopted by a variety of organizations.[48]

In selecting an existing model for data-driven decision-making or working with their staff to develop a unique process for their organization, **school leaders should prioritize the specific needs of their communities and intended applications of data-driven decision-making to meet those needs.**[49]

Essentially, the process for making data-driven decisions should ensure that the right data are examined, that relevant questions are asked about the data, that applicable insights are drawn from the data, and that school staff use those insights in an appropriate manner to come to decisions.[50] Such parameters are necessary to help staff and school leaders themselves best serve the various constituencies that compose their school community and develop the most robust and sustainable educational programs possible given existing resource allocations.[51]

Supplemental Resources

The following resources provide additional information for school leaders to explore data-informed decision-making and strategies to support it at their schools. These resources include content and recommendations that will allow school leaders to expand their own—and others'—knowledge and skills related to data literacy and data-informed decision-making.

RESOURCE	PUBLISHER	QR CODE
Data-Informed Leadership in Education [52]	The Wallace Foundation	
Description: This paper examines how educational leaders access, interpret, and use data to make decisions and improve educational programs. It also reviews practices related to effective use of data to guide organizational improvement and investigates factors that inhibit leaders ability to use data effectively.		
District Data Team Toolkit [53]	Massachusetts Department of Elementary and Secondary Education	
Description: This toolkit—while designed to support users at the district- or division-level—provides a plethora of resources that school leaders can use themselves or with school staff to build capacity around data use, promote a data culture, and make informed decisions based on the insights drawn from available data.		
Data Culture: Practices That Lead to More Informed and More Equitable Decisions for All Students [54]	Education Elements	
Description: This resource provides extensive content that school leaders can leverage to create and maintain a comprehensive data culture. Topics examined in this resource include the importance and impacts of a data culture, the key elements of establishing a data culture, and action steps to initiate and sustain a data culture.		
Linking Continuous Improvement and Adaptive Leadership [55]	ASCD	
Description: This article describes several important themes and action steps that school leaders can commit to when building a data-informed culture with their staff. Addressed content includes forging a collective purpose, developing the necessary dispositions and skills among staff, and establishing the needed conditions for continuous improvement, adaptive leadership, and data-informed decision-making.		
Making Sense of Data-Driven Decision Making in Education: Evidence from Recent RAND Research [56]	RAND Corporation	
Description: This paper provides an explanation of what data-driven decision-making is and examines the theoretical framework for implementing it in K-12 education. The paper also reviews policy implications for and research around implementing data-driven decision-making in K-12 settings.		

RESOURCE	PUBLISHER	QR CODE
Teaching and Assessing Data Literacy: Resource Guide for Supporting Pre-Service and In-Service Teachers [57]	Northern Arizona University	
Description: This guide presents information and recommendations on how to support educators in developing strong data literacy skills via targeted professional learning programming and systemic policies and structures around data analysis and data-driven decision-making. Notably, the guide references several frameworks for data literacy and data-driven decision-making in its analysis, such as the *Conceptual Framework for Data Literacy for Teachers*, the *Data Wise Improvement Process*, the *Data-Based Decision-Making Model*, and the *Conceptual Framework for Data-Driven Decision Making*.		
The Data Workout: How It's Impacting Teaching and Learning [58]	EdSurge	
Description: This webpage serves as a hub for resources on a variety of topics related to data literacy and data-driven decision-making that school leaders can review and/or share with staff working at their schools.		
Toolkit for a Workshop on Building a Culture of Data Use [59]	Regional Educational Laboratory Northeast and Islands	
Description: This webpage provides access to materials that school leaders can use to deliver a workshop focused on understanding data use in education and developing a culture of data use at one's own school. Specifically, this webpage links to a toolkit of structured activities and handouts, as well as an accompanying slide deck.		

Source: QR Code Generator[60]

Endnotes

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