



# Teacher Data Literacy: It's About Time

A Brief for State Policymakers

February  
2014

## Executive Summary

**One element of quality teaching for improving student outcomes is effective data use. Teacher data use is also the best way to maximize state investment in data systems. To date, however, policies have not gone far enough to promote the skills teachers need to be data literate. Consequently, many teachers regard data as overwhelming, rather than as a tool for improving instruction and ultimately outcomes for students. There is an urgent need to support teacher data literacy through state policy. Without it, data will continue to be a burden to teachers rather than a powerful tool for effective teaching.**

State policymakers must take a leadership role in promoting teacher data literacy. They can better support effective data use as a strategy for improving student achievement by promoting data use skills, ensuring ease of access to data, and adopting a common language about data literacy. Additionally, policymakers at the federal level can support states in promoting a data-literate teacher workforce. To promote a common language about teacher data literacy, policymakers should use the following definition of data literacy for policymaking and communication:

Data-literate educators continuously, effectively, and ethically access, interpret, act on, and communicate multiple types of data from state, local, classroom, and other sources to improve outcomes for students in a manner appropriate to educators' professional roles and responsibilities.

## Recommendations for State Policymakers

### Promote Data Use Skills

- ▶ **Embed the definition of data literacy into teacher policies and guidelines**, including program approval, licensure, professional development, and others as relevant.

- ▶ **Use licensure exams and performance assessments to measure whether educators have needed data literacy skills before entering the classroom.** Once states have set the standards of data literacy for a licensed educator, measuring whether educators are prepared with those skills before entering the classroom will also be critical.
- ▶ **Promote, support, and incentivize quality, ongoing professional development that is focused on data use to improve instruction** and is based on the definition of data literacy. Learning does not stop in college, and as data use best practices and tools change over time, receiving ongoing training will be critical for teachers.
- ▶ **Incorporate evidence of teacher data literacy skills into performance evaluations.** Receiving feedback on their data use practices and how to improve enables educators to build on preservice and in-service training and continually improve practice.

### Ensure Ease of Access

- ▶ **Provide teachers with actionable, easy to access data.** Paper files and Google documents are not enough—nor are they sufficiently secure—to provide quality access to

data. States have a critical role in supplying educators with technology-based, secure, longitudinal data.

- ▶ **Ensure that districts and schools have the needed technical infrastructure for easy data use.** States have and will need to continue to ensure that districts have the bandwidth and up-to-date technology necessary for modern data use tools.
- ▶ **Promote, support, and incentivize districts and schools to use time and resources in new ways that foster data use.** Among the greatest barriers to educator data use is a lack of time during the day to make use of the information. States can share best practices and support districts in seeking new solutions for data use, including options such as changing schedules to allow for data-driven professional learning communities and using human capital in new ways.

## Recommendations for Federal Policymakers

- ▶ **Promote, support, and incentivize data literacy** through laws, grants, or guidance that provides parameters or resources for educator quality and/or teaching and learning.

These recommendations represent a first step toward supporting teacher data literacy. State policymakers, teacher preparation programs, national organizations, and school districts will need to work further to develop the practices needed to promote teacher data literacy.

As these conversations continue and more work is done, teachers will no longer drown in data but will be able to use data to inform instruction and improve student outcomes.

## Introduction

Teachers are the most important in-school factor in student success. And good teaching does not happen by accident—it is the result of proper training, pedagogical knowledge, skills, and lifelong professional learning. Teachers can better improve their practice and student outcomes when they also have an understanding of data’s purposes, value, and uses for improving instruction. To see results, use of comprehensive, quality data—such as attendance, behavior, outcomes, course grades and patterns, interventions, growth, teacher observations, assessments data, and more—must also be

embedded in school cultures and valued and reinforced by school leaders. In addition, resources and time to use the data must be readily available.

Empowering teachers with data and the skills to use them to improve instruction increases their ability to meet policy and personal goals of ensuring that students are engaged in learning and on track for college and careers. Without necessary data use skills, teachers do not have a powerful tool to make the best decisions to improve student achievement.

### School and District Leadership: *Critical* for Data Literacy and Use

Teacher data use is a critical component of improving outcomes for students, but teachers cannot do it alone. School and district leaders and other administrative staff who support student learning goals also need to be able to collect, analyze, and use data. In addition, they can act as data champions for teachers by **demonstrating the value and use of data; leading a data-driven, collaborative culture; and supporting teachers in overcoming the barriers to effective data use**, such as limited time during the day. Local leaders are critical for creating the practices, such as professional learning communities, that lead to a culture of effective data use.

School and district leaders can promote effective data use by taking the following steps:

- Understanding how to gather and use student learning data, administrative data, and other classroom performance data to identify aggregate and individual student needs and set goals for the district or school
- Understanding how to gather and use teacher performance data to support teachers in meeting goals for student learning
- Demonstrating the value of data in meeting student goals by modeling use
- Providing ongoing, quality training on effective data use
- Building a culture of effective data use by implementing policies that allow teachers both individual and collaborative time to make use of data as part of a strategy to meet student learning goals



**State policymakers must play a leadership role in promoting teacher data literacy** through promoting the necessary skills, ensuring ease of access to quality data, and adopting a common language about teacher data literacy.

## Policy Is Driving Need for Data Use

Current and emerging state education policies seek improved results for students by focusing on quality teaching. Strategies found in school improvement plans, state flexibility waivers from federal education laws, data-driven teacher evaluation, assessments and rigorous standards, and competency-based learning and innovative digital platforms make teacher data use essential. While these policies have rendered a charge for effective teacher data use, not enough has yet been done to ensure that teachers have the skills and access to the needed conditions to meet the demand.

## Research Demonstrates the Power of Data Use

In addition to state policies that are creating a charge for more and better data use, emerging evidence suggests that when teachers have the training and skills needed to make use of data, they are better positioned to support improved outcomes for students.

- ▶ Lai and Schildkamp (2013) highlight a bevy of research that demonstrates that when teachers are given time, context, and skills to use data, student achievement improves. The authors assert that the principal reason for this is that data enable “teachers and school leaders to tailor their teaching, school practices, and curriculum to address student learning needs.”
- ▶ Ariola and Dunn (2011) highlight the success of Oregon’s investment in educator data literacy and how schools implementing data use strategies have closed achievement gaps, especially in math.
- ▶ Faria, Heppen, et al. (2012) demonstrate that in urban schools there are meaningful links between teacher and principal data use and student achievement on state assessments in some grades and subjects. This study also found that school-level supports for data use, such as data infrastructure, time to review and discuss data, professional development, and staff capacity, were also related to higher student achievement on state tests.

These and other studies suggest that when teachers have the training and time to make use of quality data as one component of improving instruction, students will do better.

At the same time that researchers have been exploring the impact of teacher data use, states have begun creating policies and directing investments toward supplying teachers with data and training on how to use the data to improve instruction. Data Quality Campaign’s annual *Data for Action* survey of all 50 states and the District of Columbia demonstrates these state efforts:

- ▶ Forty-one states have dedicated state funding to data systems, demonstrating their commitment to and district demand for data to effect change for students.
- ▶ Forty-one states report that they provide teachers and principals training on how to use data to inform instruction.
- ▶ Forty-two states report that they actively work to help teachers understand reports, such as early warning data reports.
- ▶ Nineteen states report that data literacy is a required component of becoming a licensed educator.

Though it is evident that data use may yield positive change for students, and that states are focusing policy and training on educator data literacy, research also demonstrates that there is still more work to be done.

- ▶ Means, et al. (2011) find, as others before them, that teacher data use is affected by how confident teachers feel about their knowledge and skills in data use, but teacher training has generally not addressed the necessary skills.
- ▶ Herman and Gribbons (2001), and others, emphasize that for schools to be successful, their leaders and teachers need to develop more capacity to collect, analyze, and use information to inform efforts toward meeting goals (see the *IES Practice Guide*).

## Secure Data and Data Literacy Go Hand in Hand

To trust data use, teachers, students, and parents must be confident that data about individual teachers and students are secure and that privacy is protected. Further, a data-literate educator prioritizes his or her own responsibility to be a good steward of student information, including sharing and discussing student data only as appropriate. States have a role in protecting individuals’ data and helping districts, schools, and teachers understand how to keep data secure and use them ethically.

- ▶ Work by Heppen et al. (2011) suggests that while teachers often do get training on how to access data systems and reports, they do not receive much, if any, in-service training on how to translate data into instructional decisions or activities in the classroom.
- ▶ Further, Mandinach and Gummer (forthcoming) demonstrate that teacher preparation programs place

little to no focus on preparing educators to use data available to them once they are in the classroom.

As states continue to invest in educator knowledge of data and their uses for instruction, more should be done through teacher preparation, licensing policy, in-service training, and other levers to improve educator data use skills—and ultimately outcomes for students.

## Current State: Policy and Practice

Unfortunately, for many teachers data use is not a simple, everyday practice. Instead it can often be confusing or overwhelming, or there just may not be enough time in the day to make use of the available data resources. Yet teacher data use is one of the best ways to maximize state investments in data systems. While Data Quality Campaign’s 2013 *Data for Action* survey demonstrates that states are prioritizing getting data into the hands of teachers, barriers to use persist. Those barriers include the lack of the following:

- ▶ preservice instruction and ongoing training on how to use multiple types of data
- ▶ training on how to translate data into educational decisions and classroom instruction
- ▶ time to gather, synthesize, and use data
- ▶ skills and support from school and district leadership
- ▶ access to timely, quality data
- ▶ technology and infrastructure that facilitate quick, easy access

Consequently, teachers are missing out on powerful tools that will help them better meet their students’ learning needs. Policymakers have several opportunities to better support teacher data use to improve student achievement.

### State Licensure Policies Should Drive Data Literacy Skills

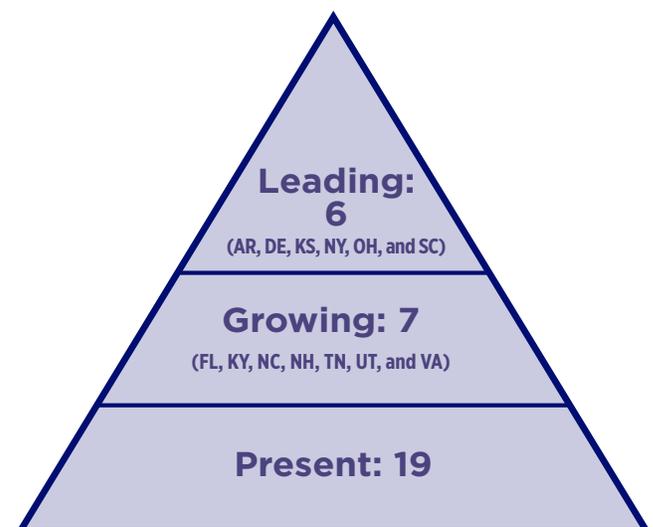
Licensure policies are meant to direct teacher preparation programs as to what skills are needed to become a qualified teacher. The *demonstration* of skills outlined in licensure policies, including data literacy, should be a requirement for becoming a licensed teacher.

**Nineteen states** reported embedding data literacy skills into their teacher licensure policies in *Data for Action*. These

results demonstrate the commitment that states are beginning to make to having policy drive data use practices. Some states, though, have gone further in promoting skills in their policies, such as engaging in a cycle of data-driven inquiry, using data to reflect on practice, communicating data with parents and other stakeholders, and more.

States that are *growing* in this area may have evidence of best practice data literacy skills in their licensure policy, but they could go further to focus on the diverse types of data available to teachers beyond assessments and include more skills that ensure that teachers are able to use data to improve practice and outcomes for students. *Leading* states have included many best practice data literacy skills and have emphasized multiple types of data beyond assessment information in their policies.

Of the 19 states, an analysis of state licensure policies<sup>1</sup> shows that **seven** are *growing* in this area and **have evidence of educator data literacy skills but could go further** to include the full breadth of skills required to be a data-literate educator; **six leading states include many best practices data literacy skills in their policies and have emphasized many types of data beyond assessment.**





## States Must Collaborate With Teacher Preparation

While teacher preparation programs have worked to prepare teachers to use data, the data landscape continues to grow and evolve, and more can be done in preservice training to ensure that teachers can effectively use the many types of data available. When data use has been included in curriculum it has focused primarily on the use of assessment data as a part of assessment literacy, which is one critically important piece but does not cover the full range of skills associated with making good use of quality data.<sup>2</sup> States and

their preparation programs can work together to ensure that teacher candidates are familiar with the full breadth of available data, their value, and their uses before the candidates enter the classroom.

Further, states, preparation programs, and ultimately districts and schools will be best served by viewing data use as one piece of a strategy for providing the best possible education to students—a strategy that also includes strong pedagogical skills, classroom management, content knowledge, and more. Teacher preparation programs are well-positioned to ensure that teacher candidates understand the value of effective data use as one piece of improving student outcomes.

## A Data Literacy Policy Framework

These changes to licensure policy and teacher preparation require a common definition of data literacy. To date, this definition of what data literacy is and what a data-literate educator should be able to do has been missing from the national dialogue.

The definition provides a common understanding of data literacy for use in relevant policies, including teacher (and principal) licensure and professional development policy. The definition provides the much-needed common language that will allow policymakers to lead conversations with educators, researchers, and advocates about teacher data literacy and help states move forward in supporting teachers in effective data use.

Once policies incorporating this definition are set, the field can dive deeper and define in more detail the associated skills needed to inform the design of teacher preparation courses or assessments of data literacy. To that end, we propose the following definition:<sup>3</sup>

### **Definition of data literacy:**

Data-literate educators continuously, effectively, and ethically access, interpret, act on, and communicate multiple types of data from state, local, classroom, and other sources to improve outcomes for students in a manner appropriate to educators' professional roles and responsibilities.

An abbreviated version of the definition may be used for communicating with fellow policymakers, educators, and the public about data literacy.

### **Abbreviated definition for communication:**

A data-literate educator possesses the knowledge and skills to access, interpret, act on, and communicate about data to support student success.

For the purposes of this definition, the terms describing key components of effective data use are used as such:

- ▶ **Continuously:** using data as part of daily routines and on an ongoing basis, rather than as a one-time event
- ▶ **Effectively:** using data to inform improved and tailored instruction, collaboration with colleagues, and other practices for the purposes of improving student learning
- ▶ **Ethically:** using information with professionalism and integrity, for intended uses only, and with consciousness of the need to protect student privacy
- ▶ **Access:** know the multiple types of data available (including but not limited to assessment data), understand which data are appropriate to address the question at hand, and know how to get the data (through electronic or other sources)
- ▶ **Interpret:** take data and analyze and/or synthesize them to turn them into information appropriate for addressing the given problem or question
- ▶ **Act:** take relevant information and apply it to generate further questions and/or apply it to decisionmaking appropriate to the given question
- ▶ **Communicate:** share data points and the information synthesized from relevant data with stakeholders including parents, students, peers, principals, and others as applicable, to generate further questions, inform decisionmaking, or provide a better understanding of student learning

# Recommendations

Teachers should no longer feel like they are drowning in data, or even treading water, but rather that they can skillfully and comfortably use the data available to them. States can take the lead by creating policies and promoting practices that support teacher data literacy and use, and federal policy can support states in meeting that goal.

## Recommendations for State Policymakers

### Promote Data Use Skills

- **Embed the definition of data literacy into teacher policies and guidelines**, including program approval, licensure, professional development, and others as relevant.

**State Example:** *Arkansas is one state that has included best practice data literacy skills in its licensure policy.<sup>4</sup> Arkansas has adopted the InTASC teaching standards, which are steeped in data and assessment literacy language, and has also gone further by writing its own language that prioritizes data literacy and use.*



- **Use licensure exams and performance assessments to measure whether educators have needed data literacy skills before entering the classroom.** Once states have set the standards of data literacy for a licensed educator, measuring whether educators are prepared with those skills before entering the classroom will also be critical.

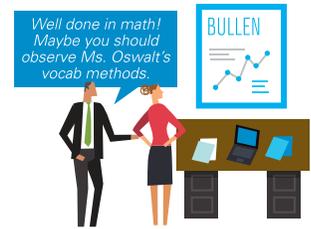


**Conditions for Success:** *Assessment of actual practice, in addition to pen-and-paper assessments, will best capture whether teachers have needed skills.*

- **Promote, support, and incentivize quality, ongoing professional development that is focused on data use to improve instruction** and is based on the definition of data literacy. Learning does not stop in college, and as data use best practices and tools change over time, receiving ongoing training on data use will be critical for teachers.

**Conditions for Success:** *Quality professional development must go above and beyond sessions on general access and*

*technology and must instead build on the foundation of effective data use provided in preservice instruction and through practice.*



**State Example:** *Oregon has long invested in time, resources, and training for ensuring that administrators and educators have the skills needed to make use of data to improve student performance. Because of this investment in people, Oregon is seeing improvements in student learning and the closure of some achievement gaps.*

- **Incorporate evidence of teacher data literacy skills into performance evaluations.** Receiving feedback on their data use practices and how to improve enables educators to build on preservice and in-service training and continually improve practice.

**Conditions for Success:** *Principals and administrators are the linchpin of a culture of data use in districts and schools. By embedding data use skills as a component of performance conversations, principals have the opportunity to promote a strategic vision of data use and ensure that educator skills are continuously improving.*

Data literacy is useless if the data are not accessible. As states and districts strengthen data policies and practices, focus must continue to be placed on growing and maintaining the technical infrastructure that allows educators to easily access and use data to improve student outcomes.

### Ensure Ease of Access

- **Provide teachers with actionable, easy to access data.** Paper files and Google documents are not enough—nor are they sufficiently secure—to provide quality access to data. States have a critical role in supplying educators with technology-based, secure, longitudinal data.

**Conditions for Success:** *The best tools for data use are created when states engage in strong feedback loops with their districts and constantly improve the data access and use tools available to educators, such as student dashboards and early warning systems.*

**State Examples:** *Georgia is a leader in providing teachers with easy access to state longitudinal data, side by side with the data available from the district. Critical to Georgia's success is a feedback loop with educators about their needs and a strategic plan that guides the Department of Education's work, outlining*

what types of data will be available, to whom, when, and how. Massachusetts joins Georgia in providing access to quality data to its districts and schools with the rollout of the state's early warning systems, which help capture which students may be going off track and are at risk of failure or dropping out.



- ▶ **Ensure that districts and schools have the needed technical infrastructure for easy data use.** States have and will need to continue to ensure that districts have the bandwidth and up-to-date technology necessary for modern data use tools.

**Conditions for Success:** *The state also has a role in promoting and supporting the types of systemic structures (i.e., protocols and governance) necessary to promote data use within districts and schools.*

**State Example:** *Arizona has acknowledged that its existing data infrastructure and the way data are collected from and delivered to its districts need improvement. In partnership with districts in the state, the Department of Education is actively streamlining data collection, supporting districts in developing strong governance and data security policies, and prioritizing expanding bandwidth.*

- ▶ **Promote, support, and incentivize districts and schools to use time and resources in new ways that foster data use.** Among the greatest barriers to educator data use is a lack of time during day to make use of the information. States can share best practices and support

districts in seeking new solutions for data use, including options such as changing schedules to allow for data-driven professional learning communities and using human capital in new ways.



**Conditions for Success:** *School boards and superintendents have a critical leadership role to play in creating the policy flexibility needed to provide time and resources for educator data use.*

**State Example:** *The Delaware Department of Education has, through its Race to the Top grant, provided the incentive for every district in the state to carve out 90 minutes per week for educators to have collaborative conversations around data in professional learning communities. Additionally, the state has funded data coaches whom districts can use to help guide educators through data-based discussions.*

## Recommendations for Federal Policymakers

- ▶ **Promote, support, and incentivize data literacy** through laws, grants, or guidance that provides parameters or resources for educator quality and/or teaching and learning.

**Conditions for Success:** *Federal policymakers can create consistency across programs and regulations by using a common definition for data literacy.*

## More to be Done

State leaders have clearly prioritized data use as a central piece of improving education. Teacher data literacy skills are critical to improving instruction, maximizing state investments in data systems, and promoting data security. To best meet the goal of improving outcomes for all students, more can be done—starting with state policy—to ensure that teachers have needed data literacy skills.

But this common definition and these recommendations for a path forward are only the beginning. State policymakers, as well as other national organizations, teacher preparation programs, and school districts, will need to take this framework as a starting point and do further work to create a data-literate teacher workforce.

Additionally, while the definition and recommendations focus primarily on teachers, they also apply to a variety of stakeholders—including principals, superintendents, and school board members—who will need to be data literate to improve outcomes for students. Policy and practice therefore will also need to focus on those stakeholders.

As conversations around data literacy continue and state policy continues to focus on empowering teachers with data, the field will move closer to a teacher workforce that no longer drowns in data but uses them as one factor in improving student achievement.

## Endnotes

- <sup>1</sup> As determined by an analysis conducted by WestEd based on a rubric developed by 20 partner organizations representing states, colleges of education, licensing and credentialing bodies, teachers and teachers unions, and advocacy organizations.
- <sup>2</sup> Mandinach, E. B., Gummer, E. S., & Friedman, J. M. (in press). How can schools of education help to build educators' capacity to use data: A systemic view of the issue. *Teachers College Record*.
- <sup>3</sup> See below for list of organizations and their representatives who worked to collaboratively develop the definition.
- <sup>4</sup> As described by the rubric developed by the members of the working group listed below.

## Acknowledgments

The contents of this paper were developed collaboratively over one year with a group of national and state-level experts. The members of the working group who diligently generated and vetted this content are the following:

**Sarah Almy**

Formerly of The Education Trust

**Helen Chong**

Bill & Melinda Gates Foundation

**Adriane Dorrington**

National Education Association

**Noelle Ellerson**

American Association of School Administrators

**Emerson Elliott**

National Council for Accreditation of Teacher Education

**Ann-Marie Faria**

American Institutes for Research

**Lisa Foehr**

Rhode Island Department of Education

**Mickey Garrison**

Oregon Department of Education

**Seth Gerson**

National Board for Professional Teaching Standards

**Mary T. Harrill-McClellan**

American Association of Colleges for Teacher Education

**Sandi Jacobs**

National Council on Teacher Quality

**Bruce Katz**

National Institute for School Leadership

**Ellen Mandinach**

WestEd

**Julie Marlette**

Formerly of 50CAN

**Kerry Moll**

Formerly of George W. Bush Institute

**Sarah Pinsky**

American Association of Colleges for Teacher Education

**Janice Poda**

Council of Chief State School Officers

**Phil Rogers**

National Association of State Departments of Teacher Education and Certification

**Carter Romansky**

The Achievement Network

**Micah Sagebiel**

Michael and Susan Dell Foundation

**Nancy Sharkey**

US Department of Education

**Maryann Snider**

Rhode Island Department of Education

**Vera Turner**

American Association of School Administrators



*Using Data  
to Improve  
Student  
Achievement*

For more information visit  
[www.DataQualityCampaign.org](http://www.DataQualityCampaign.org)  
and follow us on Facebook  
and Twitter (@EdDataCampaign).

Click or scan the code for DQC's  
best tools and resources.



The **Data Quality Campaign (DQC)** is a nonprofit, nonpartisan, national advocacy organization committed to realizing an education system in which all stakeholders—from parents to policymakers—are empowered with high-quality data from the early childhood, K-12, postsecondary, and workforce systems. To achieve this vision, DQC supports state policymakers and other key leaders to promote effective data use to ensure students graduate from high school prepared for success in college and the workplace.

**1250 H Street, NW, Suite 825, Washington, DC 20005**

**Phone: 202.393.4372 Fax: 202.393.3930 Email: [info@dataqualitycampaign.org](mailto:info@dataqualitycampaign.org)**