

Using Longitudinal Data Systems to Inform State Teacher Quality Efforts

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Executive Summary

Faced with the need to dramatically improve student outcomes, states have embraced an aggressive policy agenda that relies heavily on increasing the effectiveness of teachers and ensuring that the most effective of them are distributed in an equitable fashion. In order to answer critical education policy questions and to inform states' teacher quality agendas, states must accelerate their efforts to build and use statewide longitudinal data systems for continuous improvement. Until recently, states have collected data mostly for accountability and reporting purposes, but with full implementation of a comprehensive data system, states will have data for the first time to substantively examine not just whether students are learning but also what barriers to learning exist and what educational services are effective.

This brief attempts to answer the following questions:

- Why are states focusing now more than ever on building statewide data systems?
- What is the current national landscape with regard to state data systems?
- To what degree are the current state reform efforts around data and teacher quality driven by the stimulus funding requirements?
- What can be learned from linking teachers with students, and what are the challenges in implementing a reliable link?
- How can states build the capacity of their educators to use data so that they can become more effective teachers, and what is the role of teacher preparation programs in this effort?

About This Series

This policy brief is part of a series commissioned by the Partnership for Teacher Quality to help inform and improve teacher quality policies at state, local, and national level. The briefs address issues related to teacher licensure, teacher effectiveness, clinical preparation, and data systems, and each includes an overview of the research, promising practices, and recommendations related to their specific topic.

About the Partnership for Teacher Quality

In September 2008, the National Education Association (NEA) and the American Association of Colleges for Teacher Education (AACTE) formed the Partnership for Teacher Quality to promote awareness, understanding, and collaboration about teacher quality issues at the state level. Shared commitment to strong teacher preparation and licensure standards is the foundation for the policy proposals and meetings that have occurred between NEA affiliates and AACTE state chapters. These alliances are crucial for both organizations in the era of licensure deregulation and the undermining of teacher quality. This policy paper and others in the series are a project of the partnership.

Recommendations

- States need data systems that measure important outcomes for students in credible ways and reliably link those outcomes longitudinally so change can be assessed. These data systems must reliably link students, teachers, and courses in ways that capture the complex connections that exist between students and teachers. Educators and policy makers must collaborate with researchers to identify the most relevant data, build information systems to gather these data, create opportunities to put the data into meaningful contexts, and develop training to help them tie that information to timely and targeted actions.
- States need to engage a broad range of stakeholders in a thoughtful dialogue around the issues and challenges that must be addressed in the development and implementation of policies and practices to support the state's efforts to increase and equitably distribute effective educators.
- States must work with districts and teachers to develop the policies and business rules for identifying the “teacher of record” in all schools so that they can truly produce high-quality data that are comparable across districts within states.
- States should collaborate with and learn from their districts that are farther along in developing local data systems that link teachers with students and in implementing policies around the use of these data in high-stakes decisions.
- States should take the lead in setting policies and promoting practices that will lead to educators’ having better access to actionable data and understanding of how to use it to improve student performance.
- States should consider requiring educators seeking licensure or licensure upgrades (and the programs that prepare them) to demonstrate competence in the analysis, interpretation, and use of data as a key component of a state’s sustainability plan.

What We Mean When We Say “Teacher Data”

AACTE and NEA define “teacher data” to include ethnicity, gender, campus of employment, types of certification and credentials, subjects currently teaching, college major, graduate degrees, certification exam scores, and salary. In addition, the data on a teacher’s preparation need to be disaggregated so that preparation programs can use the information for program improvement efforts. This information should include a nuanced description of the particular program components such as content and pedagogical course work, use of technology, delivery mode, clinical preparation, and other details.

What We Mean When We Say “Student Data”

As defined by the DQC, “student data” include attendance, ethnicity, gender, English language learner status, campus of enrollment, grade level, economic status, special education status, migrant status, Title I status, gifted and talented status, participation in bilingual or English as a second language programs, performance on state standardized exams, data on students not tested (grade level, subject, and reason why not tested), transcript information for middle and high school students, student performance on SAT, SAT II, ACT, IB, and AP exams, and graduation and dropout information.

Introduction

Faced with the need to dramatically improve student outcomes, states have embraced an aggressive policy agenda that relies heavily on increasing the effectiveness of teachers and ensuring that the most effective of them are distributed in an equitable fashion. The challenges inherent in these efforts cannot be underestimated: How do we define effectiveness? Once defined, how do we measure it? How can we best encourage effective teachers to teach in challenging environments? How can we target support to the teachers who show promise but currently struggle in content areas or in certain dimensions of professional practice? How can we ensure that teachers themselves are equipped with the knowledge to use data to improve their own teaching? If policy makers and educators are to answer these critical policy questions and inform their states’ teacher quality agendas, then states must accelerate their efforts to build and use statewide longitudinal data systems for continuous improvement. Until recently, states have collected data mostly for accountability and reporting purposes, but with full implementation of a comprehensive data system, states will have data for the first time to substantively examine not just whether students are learning but also what barriers to learning exist and what educational services are effective.

The American Recovery and Reinvestment Act’s State Fiscal Stabilization Fund and Race to the Top competition both are pressuring states to give educators and policy makers high-quality information to answer the critical questions of the day. This unprecedented funding opportunity is helping states secure grants to complete their data systems and is spurring them to develop plans to use data in meaningful ways to prepare, identify, evaluate, and compensate effective teachers and principals. To that end, states are looking for models and methodologies on which to base their policy plans. States must convene and engage all stakeholders in a conversation around the best models, data, and uses to accomplish the goals the state intends to pursue to improve teacher quality. A number of states are using longitudinal data to answer questions surrounding

what is working in education and focus resources to meet students' and teachers' needs.

States must also leverage this opportunity to get this powerful data into the hands of the educators themselves. With access to actionable and timely longitudinal student data, educators will be able to target instruction, resources, and professional development opportunities based on student needs. However, not all states are taking steps to ensure that their educators have the skills to use data in the most meaningful and high-impact ways. The Data Quality Campaign reports that only 13 states currently have credentialing policies in place requiring teachers seeking certification to demonstrate the ability to adequately use data.

The Need for Better Information

A critical challenge confronting educators and policy makers is how to increase the supply and improve the distribution of great educational leaders and great teachers. The educational labor market is a loosely arrayed system in which traditional labor economics may not operate efficiently, in part, because of the lack of clarity about the outcomes of individual teachers' work. States face additional challenges due to the layering of regulatory authority between multiple governmental agencies, the hiring authority of districts, and the operation of entities that prepare teachers which has led to a system in which identifying the factors that influence teacher effectiveness and how to act on them is Byzantine in its complexity. If states hope to have a significant impact in improving the quality of teaching, they must address what has traditionally been the key barrier to change in this already complex system—the limited quality and quantity of information available to teachers, leaders, and policy makers to make well-informed decisions that lead to improved student outcomes. High-quality data are needed to inform decisions around personnel assignment, professional development, program continuation, and the services that are needed by students, teachers, and schools.

States seeking to increase the supply of great teachers clearly need new and better information. They need to know which teacher preparation programs in their state are more effective. Additionally, states need to work with teachers and other stakeholders to define effectiveness and determine measures of effectiveness. Creating this type of

effectiveness knowledge base requires a series of actions that are intuitively simple, but difficult to implement with the quality needed for effective decision making. States need data systems that measure important outcomes for students in credible ways and reliably link those outcomes longitudinally so that change can be assessed. As states work to find ways to measure teacher effectiveness in fair, valid, and reliable ways, the data systems in the states must be able to capture data that contributes to these evaluations. These data systems must reliably link students, teachers, and courses in ways that capture the complex connections that exist between students and teachers in arrangements such as team teaching.

In addition to data systems that allow leaders and policy makers to make decisions based on evidence regarding efficacy, educators at all levels need information systems and appropriate training on data use to increase their current efficacy. To have real impact, educators and policy makers must collaborate with researchers to identify the most relevant data, build information systems to gather this data, create opportunities to put those data into meaningful contexts, and develop training to help them tie that information to timely and targeted actions. Data systems will need to be designed that reflect the differentiated needs of stakeholder groups regarding the level of detail, type of analyses provided, and time sensitivity of data.

It is incumbent upon individual states and districts to convene stakeholders and begin a robust conversation around issues such as how they will assess the efficacy of educational programs and how they will define and measure the components of effective educational practice. Some of those issues are touched upon by other briefs in this series, but more broadly they are central to the expansive body of discourse in educational policy and practice. The breadth of issues regarding the many different types of data that will be needed to measure effectiveness, specific methodologies around evaluation, the standards for making decisions, and the types of data that will inform each decision are beyond the scope of this brief.

The intent of this brief is to highlight key issues in the design and use of data systems that can support data informed decision making for continuous improvement in education. The following sections describe some important considerations and examples of current practices that link

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student data over time to schools, teachers, and educational programs to support decision making at all levels.

An Unprecedented Opportunity for Change

The American Recovery and Reinvestment Act's (ARRA) State Fiscal Stabilization Fund (SFSF) requires that states make considerable progress toward meeting the information needs of educators and policy makers. Each governor has committed to building their state's educational information system to include each of the Data Quality Campaign's (DQC) 10 Essential Elements (including Element 5, the ability to link student and teacher data) of a statewide longitudinal data system by October 2011. In addition to the commitment to build data systems, governors have agreed to use data in the following ways as a requirement for receiving SFSF funds.

- States must develop individual teacher impact reports (e.g., value-added reports) for teachers in assessed grades in math and language arts.
- States must provide student growth data to teachers in assessed grades in math and language arts in a manner that is timely and informs instructional programs.
- The state must also describe and publicly report whether its district evaluation systems use student achievement data as a criteria when evaluating teachers and principals.

The U.S. Department of Education's blueprint for reauthorization of the Elementary and Secondary Education Act clearly outlines the administration's intent to infuse reauthorization with the same reform principles laid out in *Race to the Top*. These reforms rely heavily on statewide longitudinal data systems to inform state teacher quality efforts. Specific relevant provisions in *Race to the Top* include the following:

- States must design and implement educator evaluation systems that differentiate effectiveness using multiple rating categories that take into account data on student growth. Educator evaluations must be used to determine compensation, tenure, dismissal, and promotion.
- States must ensure the equitable distribution of teachers based on data.
- States must link student growth to teachers and report this information out (in aggregate) by teacher preparation program in an effort to identify the most effective preparation programs.
- States must provide data-informed professional development.

To date, 41 states have developed plans to meet the objectives of *Race to the Top*, and while only two have won grants, it is expected that more states will apply for and

The Data Quality Campaign

The Data Quality Campaign is a national, collaborative effort to encourage and support state policy makers to improve the availability and use of high-quality education data to improve student achievement. The campaign provides tools and resources that will help states implement and use longitudinal data systems, while providing a national forum for reducing duplication of effort and promoting greater coordination and consensus among the organizations focused on improving data quality, access, and use.

Given the remarkable progress made by states in the last 4 years in building statewide data systems, the campaign is now focused on helping states identify and put in place the necessary policies and practices so that key stakeholders actually use longitudinal data to help students succeed.

Visit www.DataQualityCampaign.org for more information.

receive this funding in coming rounds. As a result of ARRA, educators and policy makers across the country are examining how to use data to drive improved student outcomes and increase the supply of effective teachers in a context that is unprecedented in terms of the infusion of funding and the pace of change around information in education. To effectively leverage this opportunity, it is critical that states engage a broad range of stakeholders in a thoughtful dialogue around the issues and challenges that must be addressed in the development and implementation of policies and practices to support the state's efforts to increase and equitably distribute effective (as defined by the state/district) educators.

How Data Systems Can Contribute to Teacher Quality and Student Outcomes

It is important to acknowledge that the use of data to develop, identify, and support great educators is a domain of public discourse that is fraught with controversy. Reasonable people disagree about the adequacy of the current generation of assessments, data systems, and analytic approaches to do all that needs to be done in this domain. On the other hand, we are confronted with a daunting moral imperative: The current generation of students, and those immediately following them, cannot wait for us to develop ideal assessments, data, and information systems, to begin to meet their needs. Engaging in the work of continuous improvement in

both education and data systems at the same time requires that educators leverage currently available data to support students as we work toward stronger data systems.

Currently, one of the most widely discussed assessment models is “value added.” Value-added models are a type of data analytic tool that leverages longitudinal student data and the student-teacher linkage to examine the educational outcomes of students taught by individual teachers and served by specific educational programs. Value-added models can improve upon traditional assessments that consider only current-year performance by using prior achievement, and in some cases demographic variables such as student disability status, to examine the extent to which students’ outcomes meet or exceed expected achievement based on their history of achievement. Current models provide an illustration of beginning points, clarify some possibilities of use, and exhibit the challenges of implementation around linking teacher and student data at the state level. By citing value-added models, AACTE and the NEA are not endorsing the models but rather providing examples of how some states have approached the challenge of measuring teacher contributions to student learning.

Tennessee uses an assessment model (the Tennessee Value-Added Assessment System) linking students, teachers, achievement test results, and courses over some years to assess student outcomes that are taught by specific teachers. This type of teacher-level data system is generally intended to support the decisions that schools have to make regarding professional development, teacher assignment, and identifying where students are making strong and poor progress. However, these models examine but one dimension of what happens in schools: progress on tested subjects in tested grades. Educators, school leaders, and policy makers will need to identify a broader array of data that are informative and actionable regarding the many other dimensions of education. For example, a state or district might wish to examine differences in high school graduation rates relative to the characteristics of students entering the high school and examining specific practices in high schools.

Louisiana has deployed an assessment of teacher preparation programs based on a value added methodology in order to identify the impact of preparation programs completed by new teachers. The Louisiana assessment found that some preparation programs were producing new teachers whose students were achieving less than other new teachers in specific content areas. It is important to recognize that while the data provided information regarding areas of strength and concern, they do not clarify *why* a program is struggling in a particular content area or *how* to improve results. Focus on these critical next steps led to programmatic reviews by faculty and modifications to improve programs about which the data suggested cause for concern.

Deriving information from data systems to support educational decisions will continuously drive the need for refinement of these systems. Almost without fail, educators who are presented with new information systems ask for more information about what to do with the data, how to interpret the data, how the data break out into instructionally relevant subgroups, and how they can access the information more quickly so they can act on it. For example, the Louisiana experience with assessment of teacher preparation has led teacher preparation program faculty to request additional layers of more refined analyses including teacher-level assessment. This need for more detailed data has also led to a need for better data. One initial step has been to develop a procedure for teachers to review and verify their rosters before they are used in analyses to ensure they are correct.

Ensuring Quality in the Implementation and Use of Data Systems

Many states’ current policies and collection processes with regard to linked teacher and student data are inadequate and cannot provide policy makers and educators with reliable, valid, and relevant information to use in improving the educator workforce and student outcomes. Coupled with the tight timeline that states are under to implement their teacher/student link and develop policies for its use, there is an urgency for states to ensure that best practices are followed to the extent possible. If states are to use the teacher/student link as described above in Tennessee and Louisiana, or for other uses as mentioned at the beginning of the paper, they must work with districts to develop the policies and business rules for identifying the “teacher of record” in all schools so that they can truly produce high quality data that is comparable across districts within states. Some of the implementation challenges currently facing states include the following:

- Difficulty in capturing the multiple and complex relationships between teachers/students (e.g., one district may link just one teacher per student and the adjacent district may be able to link multiple teachers per student)
- Schedule changes and student and teacher mobility are often not captured by the district or state (e.g., the state collects data on October 1, and on October 2 three students change classes, but the state data system still has those students linked with their original teacher)
- Incorporating charter schools
- Lack of policies and practices to ensure that data is reviewed and verified by teachers

As states begin to plan, it is vital that they collaborate with and learn from their districts that have experience with

complex data systems and are further along in their understanding of how to reliably connect teachers and student through courses and learn from them. Colorado's Eagle County School District (ECSD) began linking their teacher/student data several years ago and has implemented the same value-added model that Tennessee uses. Although ECSD originally implemented the model as the basis for compensation, it is currently only used for evaluation, resource allocation, and targeted professional development. Over the years, ECSD has fine-tuned its data linkage to address many of the challenges identified above including teacher roster verification as well as the ability to more accurately capture complicated teacher-student relationships. Like many districts around the nation, ECSD has been working through these issues with their stakeholders for many years and the technical challenges and policy decisions they dealt with are now being addressed at the state level. With just 2 years to plan and implement, states have a strong incentive to reach out to their districts, learn from setbacks, and build on their successes.

How States Can Build Educator Capacity Around Data Use

States are embarking on an ambitious set of ARRA-driven reform goals that involve using data to identify, evaluate, and better prepare educators. However, in order to maximize this opportunity, states need to realize that collecting and using the data at the state and district level alone is not enough to improve student performance, and making the data available to educators is not sufficient to drive increased data usage at the classroom level. If educators lack strong skills in data access, analysis, interpretation, and use, new systems will not lead to the desired changes in student performance. Additionally, if the information is not readily available in easily understood actionable formats, it is likely to remain on a server, rather than make its way into schools and classrooms. The state is best positioned to take the lead in setting policies and promoting practices that will lead to educators' having a better access to actionable data and understanding of how to use it to improve student performance.

DQC's first survey on the 10 State Actions to Ensure Effective Data Use was released in January 2010. Based on this survey of state education agencies, *no*

states report having implemented DQC State Action 9, which encourages states to implement policies and promote practices, including professional development and credentialing, to ensure that educators know how to access, analyze, and use data appropriately. This lack of implementation must be addressed because high-stakes decisions could be made about teachers who have not yet been given the opportunity to receive adequate professional development on appropriate data analysis and use to inform their own development. Other key findings from Action 9 include these:

- Thirty-nine states report providing some type of training to educators on how to use and interpret specific reports, but only three report that they partner with teacher preparation programs to coordinate and provide this training.
- Only 13 states currently require teachers seeking certification to demonstrate the ability to interpret and use student-level and aggregate-level data in adapting classroom practices based on student need; 10 states indicate they have plans to in the future.
- Twenty-four states report that they share data with teacher preparation programs, but only five share data on how their teachers perform as measured through student performance and only 15 share the data automatically without programs having to request the data.

Given these results, there is much work to be done and room for states to innovate and share best practices with each other. To that end, there are two major avenues to build educator capacity around data use: in-service professional development and teacher preparation. There must be a focus on rich professional development centered on the appropriate interpretation and use of data. This will allow educational stakeholders such as teachers and principals to use data to improve instructional practices and thus impact student performance. A state's ability to link teacher and student data (Element 5) is a critical step to the effective develop-

ment and implementation of a comprehensive professional development plan around data use. Without this link in place, states must rely on district-level data, which is difficult because of the inconsistency across districts and the inability of low-capacity districts to provide high-quality data

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in a timely and useful manner.

Although professional development is critical, states also need to look at preservice training and their credentialing and program approval authority. Requiring educators seeking licensure or licensure enhancements (and the programs that train them) to demonstrate competence in the analysis, interpretation, and use of data is a key component of a state's sustainability plan. However, without the ability to link teacher and student data, states will not be able to return important information to teacher preparation programs to help them refine their curriculum, improve their recruitment efforts, improve the clinical experiences they offer, and understand how their graduates are performing in the field. Additionally, the state will be unable to evaluate the ultimate success of additional professional development and new licensure requirements as shown through improved student achievement.

As noted in the survey results shared in the previous section, states have not yet begun to systematically build the capacity of their educators to use data; however, a handful of states have instituted initiatives, implemented policies, and developed models that can be adapted (rather than reinvented) across states.

- Through the Oregon DATA Project, the state has successfully developed a comprehensive training program to increase educator assessment literacy at all levels and to assist school/district leaders in the creation of a culture of data. Oregon continued this work of building educator capacity by securing a federal Statewide Longitudinal Data System grant, enabling them to partner with seven institutions of higher education to develop preservice training modules based on their successful professional development program. They are working collaboratively with faculty from teacher preparation programs to incorporate their material into courses for both teachers and administrators. Topics include formative evaluation, evaluation statistics and growth models, large-scale database analytics, and e-learning and differentiated instruction. Oregon developed an evaluation component in both their professional development and preservice work to allow them to understand the degree to which data use is implemented following training as well as the impact on student learning.
- The New Mexico Principal Support Network (PSN) is providing professional development to principals and superintendents in the analysis, interpretation, and use of assessment data. Acknowledging the importance of administrators in the establishment of a culture of data, the innovative curriculum includes how to communicate data to constituencies including school boards, teachers, and the community. Members of the

PSN also work directly with their peers to analyze data, build comprehensive school improvement plans, and share promising practices for interventions.

- States such as Kansas, Louisiana, New Hampshire, and Ohio have developed credentialing/licensing policies that require teachers, principals, and superintendents to demonstrate the ability to use data at the building and/or classroom level to base decisions on student need.

The aligned funding streams of ARRA provide states with a strategic opportunity to break down traditional silos and engage policy makers and educators at all levels in a thoughtful dialogue around using data for continuous improvement. This dialogue is crucial to the development of viable data systems and to data usage that is appropriate and tied to school improvement efforts. Equipped with high-quality teacher data, student data, and the ability to link this information appropriately, states will be able to support districts, teacher preparation programs, and professional development initiatives as they seek to develop and improve the educator workforce statewide. Through examination of prior state and district efforts, we can ensure that this important work moves forward across the nation, enabling all students the benefit of an effective teacher.

The Need for Data Governance

Through data governance, organizations define the roles and responsibilities needed to institutionalize their commitment to data quality and use. Without appropriate attention to instituting a solid governance plan, states will spend an inordinate amount of time trying to navigate their way through issues of data ownership, sharing, reporting, linking, and, most important, use.

Georgia's Alliance of Education Agency Heads is well suited to guide the development of a comprehensive state plan to build educator capacity, as leaders of the following critical state agencies are among those represented: Georgia Department of Education, University System of Georgia, Georgia Professional Standards Commission, and the Governor's Office of Student Achievement.

Based on the 2009 DQC survey, 24 states report having implemented State Action 3 on data governance. Visit www.DataQualityCampaign.org for a state-by-state analysis of data governance.

Moving Forward: Begin a Dialogue with Your State Policy Maker by Asking . . .

1. To what extent has the state implemented DQC's Element 5 (linking teacher and student data), and how has the state defined "teacher of record"?
2. How is the state ensuring that the teacher and student data are accurate?
3. What is the role of the state in ensuring educators are able to access, analyze, and use data? Are policies being developed that fully leverage this role?
4. Do educators have the necessary technological tools to access, analyze, and use data to make educational decisions? If not, how can the state support district capacity?
5. How is the state working with educator preparation institutions to develop educators with the skills needed to access, analyze, and use data to make educational decisions?
6. Do educators have the time to collaborate with peers around the data and the autonomy to make instructional decisions in their schools/classrooms? If not, what policies are being developed at the state level to *support a culture of data* in districts and schools?
7. How will the state sustain these efforts past the ARRA funding period?
8. How will state data systems include the information that educator preparation programs need to measure their impact, such as the placement and retention of their teacher graduates?

About AACTE

The American Association of Colleges for Teacher Education (AACTE) is a national alliance of educator preparation programs dedicated to the highest quality professional development of teachers and school leaders in order to enhance PK-12 student learning. The 800 institutions holding AACTE membership represent public and private colleges and universities in every state, the District of Columbia, the Virgin Islands, Puerto Rico, and Guam. AACTE's reach and influence fuel its mission of serving learners by providing all school personnel with superior training and continuing education.

About the NEA

The National Education Association (NEA) is the nation's largest professional organization, representing 3.2 million elementary and secondary teachers, higher education faculty, education support professionals, school administrators, retired educators, and students preparing to become teachers.

About the Authors

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Paige Kowalski, senior associate with the Data Quality Campaign (DQC), supports state policy makers in their efforts to develop and use P-20 statewide longitudinal data systems. She leads several initiatives around DQC's State Action 9 (building educator capacity to use data), working with states and national educator groups to develop policies to support this work, advocating the importance of implementing a teacher-student data link of a quality high enough to be used in high-stakes decisions, and highlighting best practices states can follow. Kowalski also leads DQC's efforts to inform best practices in state legislation around data systems. Before joining DQC, Kowalski managed data initiatives for the Council of Chief State School Officers.



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