Turning Data into Information

The Vital Role of Research in Improving Education

When students, parents, educators, and partners have the right information to make decisions, students excel. One of the most powerful sources of information for families, educators, and policymakers about education is the high-quality analysis and research conducted by trained and engaged experts across the country. Their work gives us answers that cannot be found anywhere else—the answers that inform our decisions about programming, staffing, how to use limited resources, and how to support each student's growth. Research identifies areas of unmet need and areas of opportunity, helps education leaders invest in effective and innovative practices, and pinpoints factors that keep kids on track for success. In addition research uncovers dynamics that might challenge conventional wisdom and guide practitioners to more effective solutions. Without high-quality and trustworthy education research, communities will be making decisions in the dark, and more students will be left behind.

The Value of Education Research

States and the federal government have a legal and ethical obligation to provide high-quality educational opportunities for their students. Far from being unrelated to states' and districts' core education functions, research plays a unique and integral role in identifying best practices, applying resources responsibly, helping keep our education system globally competitive, and preparing all students for success.

In addition to conducting their own research, states and districts rely on independent researchers to determine what questions to ask and to help find answers to those questions. Even states and districts with full-time researchers lack the capacity to conduct and interpret all the relevant research they need to make informed decisions.

Research benefits states, districts, schools, educators, and families in three main ways:

1. Supporting Individual Students

States and districts employ a variety of tools and tailored strategies to understand their students' learning and help them succeed. The data and tools that inform educators' professional decisions about how to best engage, teach, and guide their students are based on prior research findings. Access to research helps states and districts take the following actions:

WHAT IS RESEARCH?

The American Educational Research Association (AERA) defines education research in part as "the scientific field of study that examines education and learning processes and the human attributes, interactions, organizations, and institutions that shape educational outcomes."

Education research uncovers the evidence that policymakers and practitioners need to provide the best education possible for all students.

- *Develop tools and strategies.* Tools like early warning systems, which help educators identify students at risk of dropping out or failing a grade, are built on research that pinpoints which early indicators are predictors of later challenges and what types of interventions help different students get back on track.
- *Use their tools and strategies most effectively.* Research can illuminate how to best provide a variety of interventions, when they are most helpful, and how changes in the structure or delivery of schooling can improve student outcomes.

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RESEARCH IN ACTION ***Supporting Individual Students***

Keeping Students on Track for Success: Massachusetts' Early Warning Indicator System includes indicators from across K–12, not just high school, to help identify and support struggling students. These indicators were identified through research.

Raising Graduation Rates: Chicago Public Schools has used research to identify trajectories and keep high school freshmen on track to graduation (the graduation rate went from 57 percent in 2007 to 84 percent in 2013).

Giving More Students a Chance: A school in North Carolina used research findings about student outcomes to identify students who were likely to be successful in taking algebra and increased enrollment among low-income students.

2. Making the Best Programming and Policy Decisions

States and districts need independent education research to make informed decisions. States have limited capacity and resources so they cannot explore every question or idea they might have. Researchers provide an important service to states, providing feedback on questions like whether to continue investing resources in a particular program or which educator preparation programs produce the best teachers for their students. Access to research helps states and districts take the following actions:

- *Use resources more effectively.* States and districts have a responsibility to be good stewards of their limited resources. Research provides the information they need to be efficient and thoughtful with their funding and staffing decisions.
- *Understand long-term effects.* Research allows states and districts to understand how certain policy or funding changes would affect student outcomes. Researchers can respond to requests from states and districts to run analyses predicting how decisions could change outcomes for certain groups of students.
- *Identify and adopt cutting-edge practices.* States and districts benefit from understanding national trends, as identified by researchers, and can intelligently adapt practices and strategies that have been proven to work.

RESEARCH IN ACTION ***Making the Best Programming and Policy Decisions***

Providing Early Childhood Programs to Save States Money: Research in North Carolina and elsewhere has shown that early childhood initiatives are cost saving and can be valuable investments for states.

Preparing Students for College: Research comparing Baltimore City Public Schools' high school indicators of college readiness with actual readiness as determined by colleges provided an opportunity for high schools and local colleges to determine how best to support students through high school and the transition into college.

Providing Financial Aid to Support College Enrollment: Research on the effects of a merit aid program found "that a relatively small amount of financial aid induces a large number of high-skilled students in Massachusetts to enroll in in-state public colleges."

3. Building Knowledge

In addition to making immediate decisions about programming and funding, states and districts need information on how students grow, develop, and learn and how larger structural features of our education system affect students. Broader research that goes beyond specific program evaluations or short-term impacts to look at how students learn best can help policymakers and education leaders make larger, future-facing decisions about how our schools work. The quality of education in future decades depends on the research questions of today. Access to research helps states and districts take the following actions:

- *Understand emerging issues.* Questions of educational equity and how the structure and administration of our nation's education system affect students are some of the most powerful being asked in education policy today. Larger, systemic investigations of these topics have produced some of the most enlightening and influential education research. Applied science and evaluations coupled with the informed knowledge of researchers together create findings that help educators and policymakers understand emerging issues and challenge conventional practices.

NEW RESEARCH OPPORTUNITIES

In December 2015, President Obama signed into law a reauthorization of the Elementary and Secondary Education Act, the Every Student Succeeds Act (ESSA). Among ESSA's numerous provisions highlighting the value of data in education is a new provision to expand the role of research in education. The law encourages states to use evidence to inform their decisionmaking by allowing them to use a broader array of studies and research designs to gather evidence about what programs and decisions work for their students.

- *Develop a greater understanding of how students learn.* Research in child development and the learning process can inform curriculum design, classroom management, and teaching methodology decisions and can even help educator preparation programs train their educators to understand their students better. For this type of research, states and districts often benefit when researchers develop partnerships, collaborate, and build off each other's work. States and local education agencies get the best information when they collaborate widely with a variety of researchers.

RESEARCH IN ACTION ***Building Knowledge***

Ensuring Equity for All Students: Independent investigations designed by concerned researchers informed the historic *Vergara v. California* trial, which successfully challenged inequitable teacher effectiveness and employment policies.

Identifying a Better Way to Teach Reading: Research on how students learn found that phonetics-based reading curricula work best. This finding transformed reading models and literacy practices in early elementary education nationwide.

DATA PRIVACY PROTECTIONS IN PLACE

Concerns about student data privacy have led many policymakers to question the value of research and consider limiting researchers' access to education data. However, important research can be conducted without compromising student privacy. Numerous protections at the federal, state, district, and research institution levels safeguard student privacy when research is being conducted. While determining **legal compliance** (notably with the **Family Educational Rights and Privacy Act**) is critical, it is only the first of a state or district's many steps in determining whether to fulfill a researcher's data request. Beyond legal compliance many agreements and reviews take place.

- Researcher data requests require multiple layers of detailed review and approval, often by both the state or district they are partnering with and the researcher's own institution. By following these processes, states and districts make sure that they are working with researchers wisely and are protecting students' privacy.
- Researchers complete sophisticated data-sharing agreements with the institutions or agencies providing data. The agreements articulate the terms of the researchers' work, their access to data, and often, serious penalties for any misuse of data.
- Researchers associated with universities must complete rigorous trainings on appropriate data use and may be subject to additional data-sharing agreements, which can implicate the university were there to be any instance of researcher misconduct.
- Depending on the nature of their research, researchers may have to have their research plan approved by an Institutional Review Board (IRB). An IRB is an independent panel of experts who review proposed studies with human subjects to make sure that the studies follow strict ethical guidelines.
- Aside from being subject to strict data-use guidelines themselves, members of the research community can actually help monitor the activities of other parties and hold states and districts accountable for their own data work. Because researchers are independent from the state or district, they can help identify any data misinterpretations.

RESEARCH IN ACTION ***Ensuring Privacy***

Keeping Data Private: A data governance guide and infographic from the Kansas State Department of Education details the personnel, questions, communications, and procedures that make up the state's data disclosure decisionmaking process. In articulating this detailed process, the Kansas State Department of Education can ensure that all approved data requests meet stringent privacy, security, and use standards and help improve the quality of education and research in the state.

WHAT TYPES OF DATA DO RESEARCHERS REALLY NEED?

Researchers must start with their research questions and carefully consider the goals and the methods of their proposed research before requesting any data. Nearly all research can be done without ever identifying a student, and in many cases, researchers may be able to use publicly available data. However, in general, researchers need data that has the following characteristics:

- **Student level.** While some research can be conducted with aggregate data, in many cases research simply cannot be done without student-level data. Aggregate data (data about groups of students) is often too blunt a tool for most research and can bias important policy decisions. However, research conducted with student-level data should never compromise student privacy.
  - The best research frequently shows that policies and practices affect different children very differently. We need to know what practices work best for which students—something that would be impossible to know with aggregate data. Every student is unique and deserves to be treated as such.
  - Student-level data helps educators understand different subgroups of students. For example, having a high school graduation rate for students with disabilities is important, but if schools have student-level information and can look at separate graduation rates for students with disabilities who are also English language learners, who quality for free or reduced-price lunch, or who are African American, they can better understand which students their supports are helping and where they need to find new ways to help all students succeed.
  - Research conducted with aggregate data cannot look at small populations. In rural areas or for schools with a small number of students in certain populations, aggregated data means that researchers will not be able to understand those students.
- **Longitudinal.** Understanding student growth requires student-level data linked over time (longitudinal data).
  - Without longitudinal data, understanding a student's growth over time or how a student learns in response to a specific curriculum or program is difficult for researchers. To understand these types of issues, researchers need data from more than one point in time. To connect the data accurately, researchers must be able to see which data points describe the same student, a process that requires **deidentified data** (data that is about an individual but does not expose his or her identity). Deidentified data often uses "unique student identifiers" so that data on individuals can be connected over time without ever exposing their name or other information that could identify them.
- **Complete.** Researchers need data that accurately represents the full population they are studying.
  - Incomplete data may not accurately represent a school's, district's, or state's population and outcomes and can therefore profoundly compromise research findings.
  - Compromised research leads to less effective and most costly policy decisions.

See the next section for more on the importance of complete and accurate data in education research.

Meaningful Research Requires Complete and Accurate Data

A lack of transparency around the value of research and the protection of student privacy has pushed many families to question the value of data, launching a movement to opt their students out of some data collection and use, often including research. When parents can opt their children's records out of research studies or when only aggregate data are used and small groups of students cannot be studied, researchers are left with incomplete data that does not accurately represent the diversity of students in a school, district, or state.

Incomplete data can profoundly compromise research findings. Flawed conclusions can lead to flawed policy decisions.

- *Incomplete data yields incomplete results*. *Education Week*'s interactive infographic shows how even small amounts of opting out can significantly affect school ratings and other key accountability measures.
- *Opt-out bias can be hard to see*. Understanding how opting out has biased a particular study is difficult since researchers cannot know the characteristics of the individuals who opted out (for the simple reason that they *did* opt out).

- *Opting out is not random.* Similar types of parents may be more likely to opt in or out of testing and different types of research, which could result in certain populations being misrepresented in the data and significantly skewed findings. If whole groups of students are underrepresented in the information provided to policymakers and used to make important education choices, policies are more likely to not accurately reflect their needs or provide the necessary supports and resources.

Deidentifying and aggregating data can place an enormous burden on schools and districts.

- There is no single version of "aggregate data" or "deidentified data" for a school or district. Districts may have to aggregate data sets differently for each research project they need to understand and serve their students, requiring them to spend time and effort compiling different sets of data.
- If states allow parents to opt out of each individual study using student-level data, they create an enormous administrative burden for schools, who must contact parents for each and every study (including parents or students who may have left the school system years ago), monitor responses, and alter data sets accordingly.
- This administrative burden could prompt school, district, or state officials to choose not to participate in research studies that could produce useful, empowering information for them and their students.

Conclusion

The past two decades have seen an incredible increase in the quality and quantity of education research conducted. This research has shined a light on and informed our nation's best practices and most meaningful decisions for students. Research plays a critical and irreplaceable role in creating an innovative, globally competitive, and personalized education system. Without student-level research, we lose the ability to understand what is working and to make the best decisions for our students. It is imperative that policymakers actively safeguard student data privacy, recognize the value of research in preparing all of our students for success, and continue to support research in lighting the path ahead.

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The Data Quality Campaign is a nonprofit policy and advocacy organization leading the effort to bring every part of the education community together to empower educators, families, and policymakers with quality information to make decisions that ensure that students excel. For more information, go to www.dataqualitycampaign.org and follow us on Facebook and Twitter (@EdDataCampaign).