

BUILDING LONGITUDINAL DATA SYSTEMS IN KANSAS AND VIRGINIA

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The passage of the No Child Left Behind Act (NCLB) brought about more than just a change in how accountability works in the education sector. In order to meet the reporting requirements of NCLB, staff at state education departments across the country realized that they would need to drastically alter not just their data collection systems, but the role of the states and the culture of data in education. Prior to NCLB, most education departments served as a conduit of data—they collected specific pieces of data from the school districts and passed them to the U.S. Department of Education as required by law, or produced state-mandated reports with the data. The state was rarely a user of the data, especially not with the purpose of helping districts determine better ways to educate their students.

Without the perceived need to do in-depth analyses of the data received from districts, it was common practice across states to ask for and receive aggregate statistics instead of student-level data. That is, districts would send the count of students by race/ethnicity or the number and percentage of students who passed the statewide assessment by race/ethnicity instead of sending individual records for each student that included fields for race/ethnicity, assessment scores, limited English proficient status, and so on.

Having all of this detailed student-level data would enable a tremendous amount of analysis, but since the state education departments had neither a state nor a federal mandate to analyze the data nor the staff to do so, they were content to receive aggregate data.

Prior to NCLB, discussions about collecting student-level data were already occurring, but there was much resistance in many states to the idea. Since a few states did already collect student-level data and track students over time, discussions of the benefits and the requirements had been going on for a few years at annual conferences of data directors. It was obvious that unique student identifiers would be necessary, but staff from many states indicated that the political climate in their state (among parents and schools in particular) would *never* allow the tracking of individual student-level data by a state agency. In fact, Ohio has a law prohibiting its education department from collecting or maintaining individually identifiable data (names, dates of birth) for students.

While NCLB did not mandate that states develop a student-level data system, it was quickly apparent to states that they would not be able to meet NCLB reporting requirements without one. For example, states were required to show how students receiving English language learner (ELL) services performed after participating in ELL programs for the allowable three years. Unless states could track which students received three years of services and connect them with subsequent assessment scores, they would not be able to meet this reporting requirement. There were so few examples of student-level data systems at the state level across the country that there was a lot of confusion about how to build one and what exactly states were to do with all of that information. In 2003, the National Center for Educational Accountability, now known as the National Center for Educational Achievement (NCEA), began surveying states on whether they had in place nine essential elements of a robust longitudinal data system. NCEA developed the list of elements based on research that it was conducting, often at the behest of governors or other state policymakers. The early research by NCEA was conducted in Texas and Florida because they had many years of student-level data. When asked by policymakers in other states to conduct similar analyses, NCEA had to decline because the states only had aggregate data collections.

There was a convergence of energy in 2005, when almost all states were planning to build student-level data systems, but confusion reigned about what

a longitudinal data system really was, and many states had concerns about student privacy laws. In November 2005, the Data Quality Campaign (housed at NCEA) was launched. By this time, the nine essential elements had been expanded to ten, a few states had made progress in designing their longitudinal data systems, and there was more agreement among state policymakers that student-level data systems were essential. While the stated goal of the Data Quality Campaign was to get states to implement the ten essential elements of a robust student-level longitudinal data system, the ultimate purpose of the campaign was to get state policymakers to use those data to inform their policies, and to get educators to use data to improve instruction.

The three states whose stories are told here—California, Virginia, and Kansas—were on the leading edge of states deploying unique student identifiers (which are the basis for developing a data system capable of linking student data across years) between 2002 and 2004. These states have taken very different routes along the way due in part to different cultural issues and to different types of expertise within their education departments. Staff in Kansas and Virginia have been successful in building robust student-level systems that ultimately help policymakers and educators, and in gaining buy-in from school district staff along the way. California has struggled with some elements of its data system, though it expects to have a fully functional one by 2009-10. California's story is told in great detail in an earlier chapter in this volume by RiShawn Biddle. In this chapter, efforts by Virginia and Kansas to develop data systems are recounted, and some thoughts are offered as to why these two states have been more successful than California.

California

California mandated in 2002 that a unique student identifier be implemented statewide via the California School Information Systems (CSIS). Staff in CSIS and the California Department of Education have worked together to share data to meet state and federal reporting requirements. As of July 2005, all students have been assigned an identifier. While CSIS is mandated to collect data, it is not mandated to conduct research or analysis on the data; consequently, there is no effort to share data with policymakers, researchers or educators so that data can be used to inform new policies and practices.

California has moved from having two of the nine elements of a robust longitudinal data system in 2003 to seven of ten elements in 2007, and back

to six elements in 2008. (The state's education department erroneously reported that it collected student-level college readiness test scores in 2007). With the assignment of unique student identifiers to all students in the system, the state now has the ability to track some student information across years, including student-level graduation and dropout data, but not test scores for students across the state. A new initiative called the California Longitudinal Pupil Achievement Data System (CALPADS) will include student test scores. The state department of education is also in the process of developing a course code system that will enable it to maintain course transcript information and connect student and teacher data in CALPADS. The data system is expected to be fully functional in 2009-10, so while California's education department has checked off six of the ten essential elements outlined by the Data Quality Campaign,¹ some of those elements are not yet fully operational. At this point student data are seldom used beyond compliance and accountability.

Kansas

With the advent of NCLB, leaders of the Kansas State Department of Education (KSDE) understood that they needed to develop a student-level data collection system. The state education department initially used funds received through a federal grant to develop their student-level data collection system, and the state legislature provided funds to do the initial work in building their longitudinal "enterprise" data warehouse.² Education department leadership, including both former and current chief state school officers, has supported the building of this robust data system as necessary to comply with NCLB and to provide districts and others with the information needed to improve student achievement.

Kansas has moved from having two of the ten essential elements in 2003 to having six of them in 2008. In those five years, KSDE has implemented a unique statewide student identifier that tracks students' demographic, enrollment, and assessment data across school years and as students change schools and/or districts. The department also now has the ability to track individual students' graduation or dropout status. Staff in Kansas are developing an enterprise data warehouse to increase access to data by key stakeholders and are working with staff in higher education to connect student-level data across sectors. Student-level course completion and college readiness data are targeted for collection in

the 2009-10 school year, which means that Kansas will soon have additional points on the Data Quality Campaign survey.³

Virginia

Leadership at the Virginia Department of Education (VDOE) also understood that in order to comply with NCLB, the department would need to develop the means to track student data over time. Staff at the state's education department began investigating a system to assign unique identifiers (called State Testing IDs in Virginia) and what systemic changes needed to be made in order to move from collecting aggregate data to collecting student-level data. About the same time that the department was reviewing NCLB requirements, Virginia's recently elected governor, Mark Warner, asked some key questions about student performance and teacher preparation programs that could not be answered with the data that VDOE collected. The convergence of conversations around student-level data culminated in the governor and the education department working with the general assembly to procure the necessary financial resources for the state and districts to assign unique student identifiers and implement a new student-level data collection system.

Since 2003, VDOE has moved from having five of the original nine essential elements of a robust longitudinal data system to having seven of ten current elements. The department had collected test scores (from the Standards of Learning assessment), demographic and enrollment data, and graduation status at the student-level data prior to 2003. They have since expanded the use of the unique student testing identifier that allows tracking of student performance across years and are now collecting student-level college readiness scores. VDOE is working with postsecondary leaders to connect students' data across sectors. In addition, since 2005 the department has worked with a vendor to develop and deploy a robust data warehouse with reporting and analysis tools for use by teachers, principals, and district staff.

The rest of this chapter will provide a more in-depth description of the work undertaken by Kansas and Virginia over the last five years as a counterweight to the chapter about California in this volume. The California chapter shows how difficult it can be to implement a large scale data system when there is little coordination between data champions and conflicting visions among oversight agencies. While Kansas and Virginia have traveled different paths, they have both succeeded in building data systems that meet both federal reporting

requirements and the needs of policymakers, managers, and local educators. Success in Kansas and Virginia, as will be shown in this chapter, is due in large part to three things: a strong data champion, room for the state to be flexible without excessive oversight, and a unified mission for the data system.

Kansas

Impetus for a Student-level Data System

After NCLB was passed, staff at the Kansas State Department of Education began identifying necessary changes in the existing data system and data collection practices in light of NCLB reporting requirements. There was no state legislative mandate to guide department activities regarding NCLB; the response to NCLB was left to staff and not dictated by the legislature.

After reviewing federal and state legislation, internal resources, and lessons learned from other states and other industries, education department staff felt that the only way to meet NCLB requirements was to develop a statewide student identifier. The identifier would be associated with each student in each of the critical data collections in order to garner the most complete data set from which to study student academic and performance history. Staff decided to implement a student identifier assignment and tracking system purchased from a vendor, and all students received unique statewide identifiers in spring 2005. They also decided to develop their student-level data collection system in-house and closely integrate it with the identifier assignment system. This integrated system, known as Kansas Individual Data on Students (KIDS), was implemented in the fall of 2005 and is used to collect enrollment, program and assessment data.

The Kansas education department expected some push-back from key stakeholders about creating a student identifier, but received much less than expected. A few parents were concerned that assigning identifiers to students and tracking their performance and program participation could lead to long-term labeling, prejudicial treatment, and embarrassment. Several district superintendents raised concerns about the amount of work required to create the new data system. However, clear explanations of the new NCLB requirements and privacy protection practices quieted the objections. Staff—with strong support from the commissioner and deputy commissioner of education—spent a lot of time explaining the reasons for and benefits of implementing a student-

level data system; apparently, open communication from the state was enough to address most folks' concerns.

In Kansas, the department of education was able to serve as a champion for the data system, and for the most part the department was able to speak in a single voice about the changes that were needed. In California, the education department played a very different role. California is a "state mandate" state with an established culture in which the department does not collect data without a specific mandate and funding. In California, there were multiple data champions, both inside and outside of state government. In some instances the different data champions in California advocated for different data system features and goals. During the planning and implementation of the data system, California Department of Education was never able to convey and act on a strong unified message about the data system.

Funding

Once the decision to develop KIDS was made, the next big hurdle was to find the funds for design and implementation. Long before the Institute of Education Sciences (IES) began providing competitive grants to states to build longitudinal data systems in 2005, the U.S. Department of Education provided grants to states for Safe and Drug Free Schools. States were encouraged to create data systems to track information about student disciplinary incidents (e.g., fights, suspensions, drugs or guns at school). The Kansas State Department of Education applied for and received a grant from the Safe and Drug Free Schools program to build a student-level discipline system. This provided a great opportunity to develop a student identifier system and to link the identifier with students' discipline records. Kansas used part of this grant to develop the KIDS student-level data collection system. The student identifier was then expanded to other student-level data collections, such as special education, migrant, and career and technical education. The KIDS student data collection system is also the basis for school accountability and state and federal funding and reporting.

In January 2006, the legislative agenda of the Kansas State Board of Education included \$2.4 million for building the longitudinal Enterprise Data System (EDS), and the state legislature committed those funds over three years. Today, Kansas' education department is in the final phases of developing and

implementing the system and expects to launch EDS by the end of 2009. (In California, on the other hand, there were great battles in the legislature over funding for new data collections, and the funding desired by data champions was rarely committed.)

KSDE was awarded a \$3.8 million grant from the federal Institute of Education Sciences Statewide Longitudinal Data System grant program in August 2007. The objectives of this grant include enhancing staff and licensure data systems, establishing a statewide course code system and collecting student course completion data. In addition, staff will use these funds to implement business intelligence tools and decision support systems for stakeholders, to provide training on effectively using data, and to create a research consortium to design and implement a research agenda that uses the Enterprise Data System to inform education decisions and identify best practices.

Technology Vision

A tremendous amount of work was done prior to 2005 to review the information technology structure at the state and district levels, to define the data elements that needed to be collected for NCLB, and to research the best approach to meeting state and local needs. In April 2004, the state hired a new director of information technology, and she, along with the director of planning and research, provided leadership and vision for this work. However, a year after the statewide identifier and KIDS system were deployed, and before the Education Data System was commissioned, the director of planning and research retired from the state education department. (All is not lost though: she is currently employed within the postsecondary sector and is working with KSDE on the connection between K-12 and postsecondary data systems.)

The director of information technology came to the agency from the private sector, where she spent most of her career in telecommunications and finance. She brought to the agency an enterprise-wide perspective (integrating all areas of the organization in a cohesive system) and experience with data warehousing. Her skills have been extremely valuable; much of the department's success in developing its data system can be attributed to a sound vision and clear, honest, and frequent communications between the state, the districts, and other stakeholders.

Enterprise Architecture

Launching a data system with an enterprise-wide perspective does not mean just addressing the technology changes that affect all program areas; it includes a culture change, which requires the active involvement of staff in all areas of the agency in the design, maintenance and governance of the data system.

Involving Stakeholders

Before building their new systems, staff considered both technical and business aspects of what was needed.⁴ Key questions that were asked included:

- What do your stakeholders want?
- How does our current environment compare to the vision of the new system?
- What needs to be done?
- How will we do it?
- Who will do it?
- When will we do it?

In order to answer these questions, the Kansas Department of Education worked with stakeholders to clarify their needs and determine how they could be met. These stakeholder groups included parents, teachers, principals, district superintendents, school boards, and state policymakers. For example, parents had questions about protecting student privacy, while teachers and principals were concerned about how data from their schools would be used and what student-level data they would receive to help them improve instruction. Based on questions and comments from stakeholders about what they needed the system to do, KSDE developed policies and procedures dealing with privacy protection, data access, and data use. They also used this information to develop communication strategies for sharing these policies and procedures with stakeholders. Staff knew it was also important to identify the data champions (which in this case turned out to be the state board of education, commissioner of education, and governor) who could be included as necessary in conversations with stakeholders.

While staff in California are developing a new longitudinal data system, the commitment to building an enterprise-wide system is missing. California's data system is seen as an information technology project, not an endeavor involving the entire department of education. Creating an enterprise-wide system requires ongoing input and participation from across the entire department of education, and a real change in culture. Unless the entire department is engaged—and unless school districts, in turn, buy in—an enterprise-wide system will fail to live up to its potential.

Stumbling Blocks

Implementing a new data system involves massive changes at both the state and local levels, and Kansas was also implementing a new assessment system at the same time. The commissioner determined that the new identifiers should be included in the new assessment system, and both systems were fully implemented during the 2005–06 school year. Doing everything at once created a tremendous burden for the state as well as for schools and districts. The organizations had to change the way they operated, and implementing the changes required a lot of communication between program areas, schools, and the district central office. As to be expected, there were stumbling blocks and criticism.

Schools and districts had a steep learning curve, just as state education department staff had a lot to learn about school and district processes. Some of the specific challenges included security issues (user authentication and confidentiality policies), the variety of vendors supplying district student information systems, communication across state education offices, communication within schools and with the state, and data quality processes. As a result of so many changes in such a short period of time, the quality of the data collected in 2005 is likely not as high as in subsequent years, when the training was better and the processes cleaner. Kathy Gosa, Director of Information Technology, shared the following description of the first year:

During the first year of the KIDS student-level data collection, we did provide training; however in many cases, since neither we nor the schools had a firm understanding of the new role, the person who attended training was not the person who ended up submitting the data! Therefore many of the folks who had to collect and submit the data had the task dumped in their laps with no training and little information. This meant that we had a large backlog of

help-desk calls, and several of us spent eight hours a day emailing answers to folks, and then had to do our jobs after that! This also meant that many times schools were left to figure out many things on their own. We heard from school staff and superintendents about secretaries who had to work holidays, weekends, and evenings to get the data put together, and several of them actually quit their jobs because they couldn't take it! I received a number of irate emails and phone calls explaining that time spent on submitting data to the state was taking away from educating students.

In addition, as Kansas developed the KIDS student-level data collection system we made a number of assumptions regarding how schools work, but in several cases what we assumed was not reality. For example we thought that the school that gets the state funding for a student should also know the details about the student's education. However, we found that in many cases this wasn't true and so schools were required to submit data they didn't have! Some didn't submit them, some made them up (we believe), and some contacted the school of attendance and got the data, then sent them to us. All of these caused a significant burden on the schools, and they didn't like it and let us know about it. We also assumed that all schools had some way to create and submit data files. Again, this wasn't reality. Once we discovered that a number of schools did not have student information systems, it was well into the first submission cycle, so we created an Excel template for them and gave instructions regarding how to populate it. But then we found that many of those folks had no idea how to use Excel! Again, this ended up taking a lot of help-desk time and causing a great deal of frustration for schools as we had to walk them through the process.⁵

The first year, many lessons were learned that resulted in improvements to the applications, documentation, communication standards, data governance, training, and data quality processes.⁶ As a result, the state education department believes there have been fewer stumbling blocks and better data quality with each passing year. While that first year was very painful, the state believes that it is farther along than it would have been if it had taken a piecemeal approach to implementation.

While Kansas' efforts to help districts adjust to the new data system have been ongoing, California's efforts to bring districts on board with new data procedures have been intermittent. The state has come up with funding to allow a limited number of districts to participate in initiatives aimed at shoring up district-level data practices; the remaining districts are simply not able to participate.

Data Governance

A key feature of Kansas's enterprise-wide solution was to develop a high-level three-year plan that integrated multiple initiatives. The state also developed a data governance structure to oversee the development and maintenance of the education department's data systems.⁷ A critical function in this structure is the data governance board that is made up of directors of teams which are responsible for applications and their associated data. Board members include representatives from many different divisions across the agency, some directly involved with curriculum and assessments, some not. Generally, people think of education data as meaning test scores and student enrollment, but Kansas is involving all aspects of organization, student and teacher data in their solution.

Involving agency staff from diverse areas and requiring them to participate in detailed conversations about data policy was quite a change for the state's education department. Over time the benefits of creating and maintaining a strong data governance structure became apparent to all parties, and the data governance process has become a foundation of the data infrastructure within the agency. Another benefit of the agency's data governance process is the message it sends to districts about developing a culture of data. The districts are not hearing about data just from the information technology staff; they receive a strong message about focusing on data from people throughout the state education department.

The Kansas State Department of Education, like most state education agencies, has an audit process to verify the quality of all data submitted from school districts. However, correcting data quality issues at the state level leaves schools and districts with poor data in their local systems. In a proactive measure to improve data quality at the point of entry, the state has developed a Data Quality Certification program for school-level staff.

Kansas is taking a slow and deliberate path towards determining how to use the data (beyond meeting state and federal reporting requirements) and how to provide the data back to schools and districts. It has launched a research consortium in partnership with the University of Kansas, Kansas State University, and the Kansas Board of Regents to develop and implement a statewide agenda of key research topics and to develop a process for using data to improve instruction and student achievement.

Future Goals

There is still much work to be done on Kansas's data system. In addition to developing a research agenda that will make full use of the data system, the education department has identified additional data elements that need to be added to meet federal and state reporting. Kansas, along with all states, is realizing that building a longitudinal data system is not a project with an end date. These systems, and the technology behind them, will need to go through changes (both expansions and deletions) to stay up-to-date with reporting requirements, school and district needs, and state-of-the-art technology.

The next big hurdle the state faces is the need for funds to sustain the data system. The education department has staff with the requisite skills and knowledge to maintain and expand the systems. However, the funding for the technology, much of the programming staff, and the training comes from three-year grants from the state and federal government. Kansas, like other states, will soon have to locate the necessary resources to keep the system running.

Virginia

The Impetus to Create a Student-level Data System

In 2000, Virginia launched the Standards of Learning (SOL) Technology Initiative for public schools with the goal of reducing student-to-computer ratios; creating internet-ready local area networks and high-speed, high-bandwidth capability in all schools; and establishing a statewide online testing system.⁸ The SOLs describe the commonwealth's expectations for learning and achievement for P-12 students in English, mathematics, science, history and social science, technology, the fine arts, foreign language, health, physical education, and driver education, which were initially approved in 1995. As part of the SOL Technology Initiative, the state legislature mandated an online testing system to hasten the turnaround time between student assessment and the receipt of test results in the classroom. One byproduct of the online testing was that it made the uploading of data from districts easier and facilitated more reporting of data back to districts. The most significant by-product, though, was the construction of a robust technology infrastructure in schools that would support testing, but would also provide access to a wealth of instructional materials via the internet throughout the school year.

Leadership at the Virginia Department of Education understood in 2002 that in order to comply with NCLB, the department would need to develop the

means to track longitudinal data for individual students. Department staff also wanted to put data into the hands of teachers so they could use them to improve student achievement, instead of just using the data for compliance and accountability purposes. However, it was difficult to consider collecting individual student data when the state had privacy laws at the time that were more stringent than the FERPA regulations.

Between 2002 and 2003, they brought in outside experts to conduct a needs analysis and reviewed lessons learned from other states and industries. Ultimately, Virginia implemented the Education Information Management System (EIMS) in order to meet state and federal reporting requirements and enable stakeholders at all levels to make informed decisions based on accurate and timely data. EIMS would have tremendous potential to reduce the burden on district staff by streamlining and automating the data collection process, allowing staff and administrator time to be redirected towards instruction. The student-level data collection would also improve data quality.

Governor's Interest

In 2001, at the same time that Virginia was reviewing NCLB requirements, a new governor, Mark Warner, was elected to office. Governor Warner had a business background and a keen interest in education. Early on in his term he asked some key questions about student progress (e.g., what percentage of high school graduates went on to higher education in the state and how they did perform there?) and teacher preparation programs (e.g., how well were teachers' students performing on the state Standards of Learning?) that could not be answered with the data currently collected. Governor Warner was interested in what happened to individuals as they transitioned across education sectors and he wanted to be able to identify appropriate interventions, improve teacher preparation, and highlight programs or services in need of improvement. Essentially, the governor wanted a data system that would be able to answer many basic policy questions. With his executive authority, the department of education could pilot a student information system in a few volunteer districts. Once the pilot was implemented and had support from participating districts, the governor and education department leadership went to the general assembly for ongoing resources.

In Virginia, efforts to build a data system have from the start been about making data available to policymakers, managers, and teachers. In California,

by contrast, efforts to develop data systems have been consistently focused on meeting state and federal reporting requirements. State legislators launched CALPADS to meet new federal reporting requirements for NCLB as well as Perkins regulations for career and technical education. Moving to a student-level data collection system will clearly help California meet current and future reporting requirements more easily. However, education advocates in California lament that there is little energy being put into getting the student-level data into the hands of local educators in a timely fashion so that they can improve instruction and student achievement.

Financial Support from the State

The SOL Technology Initiative was launched prior to NCLB with a \$360 million appropriation from the general assembly. These funds were provided to the department and schools to build the infrastructure for a statewide online testing system and to increase computer and internet use in the schools.⁹

Virginia used NCLB Assessment funds to pilot the new system prior to making it a statewide effort and asking for state funds. Based on the vision of a long-term data collection, storage and reporting system, staff estimated a \$35 million price tag to expand the pilot to the entire state. Since the state could not afford to fund the entire system at once, they began to work on it piecemeal. Since 2004, the general assembly has appropriated more than \$13 million to support the development of the new data system.¹⁰ The annual costs for what is in place as of 2008 run about \$3.5 million.

Virginia received a \$6.1 million grant in 2007 from the federal government to enhance the data system for collecting, reporting, and analyzing student data from school divisions. The grant will enable the state to develop an electronic system that allows for the exchange of student records between schools within Virginia and between P-12 and postsecondary institutions. In addition, they will expand their current web-based user interface and conduct additional training for administrators, counselors and teachers who use the data warehouse.

Challenges to Address

Concerns about Data Use

Virginia did not have state testing identifiers prior to building the system and did not have the ability to track student test scores over time, but they

wanted to be able to assess students' progress on the Standards of Learning. Many stakeholders in Virginia were uncomfortable with the idea of tracking student test scores across years, much less other types of student data, particularly without a clear understanding of how the data would be used, so the department was careful to talk about building a student information system that would help teachers help students. As the expanded system has been built, getting teachers and administrators data they need to improve student achievement has been as much a priority as calculating Adequate Yearly Progress or other accountability indicators.

Stakeholder Buy-in and Involvement

Even though Virginia developed a ten-year plan, starting in 2002, for developing their expanded data system, they were constrained by the need to make a lot of progress in a short period of time since governors in Virginia only serve one term. That meant that the department only had until March 2005 to develop and deploy the initial phases of the longitudinal data system. This put a tremendous amount of pressure on state education department staff and the districts, and required that leadership and staff work closely with everyone from higher education to assessment coordinators to ensure that all were kept apprised of plans and progress and that concerns raised by their stakeholders were addressed.

Staff created an advisory committee of representatives from a variety of districts—large, small, urban, rural, wealthy, and not-so-wealthy. They strategically invited particular staffers who had been generally more resistant to change to participate in the advisory board in order to hear and address their complaints and questions early on in the process.

Virginia, like all states, has districts of varying sizes (from 303 students to 164,000) and resource levels. Large districts often have more resources (staff and money) to devote to information systems, training, and programming than their state counterparts. In Virginia, the Fairfax County school district had developed their own data warehouse and a sophisticated student-level data system, and had a full a research and evaluation staff before the state began developing its own data system. On the other hand, most school districts in the state barely had the information technology staff to create the files necessary to meet state reporting requirements, much less analyze their data and share them with their teachers. The new system would have to be built to meet the

needs of most districts and not complicate the systems in place in larger, more sophisticated districts.

Selecting a Vendor and Designing the System

Virginia, like most other states, is a strong “local control” state, meaning that the state education department cannot dictate much to its districts. Local control extends to the student information systems purchased at the district level. Districts purchase their student information systems from the vendor of their choice; consequently, there are systems developed and maintained by a plethora of vendors across the state. Any changes to the state data collection system must take into consideration the various types of systems maintained by the districts.

As a leader in the construction of a new generation of data systems, Virginia learned a lot of lessons the hard way. One such lesson was that, while there were a handful of vendors in the education arena promising that they could build a system, the vendors had much to learn about assigning and deploying student identifiers on a statewide scale, building data warehouses, and collecting data from districts. State education department staff thought they would get more guidance from the vendor than they did, and the vendor had a lot to learn about working with so many diverse districts. It was critical, therefore, that the department create advisory committees to ensure that districts were vested in building the system and would help the vendor and department staff understand the complications and constraints involved in building this system.

Data Sharing and Use

Technological Issues

As stated previously, the fact that there were a variety of vendors supplying student information systems to the 132 districts, and that the state education department was introducing a state-level vendor and drastically different data collection procedures into the mix, created a difficult situation for all parties, especially since existing data collections had to continue until the new system was deployed. The hardware and software technology available for individual-level tracking systems had improved drastically in the years leading up to the NCLB era, but changes to existing systems were not easy or cheap.

One recent development was the advent of “interoperability standards.” With these new standards and specific software and hardware, it was possible to more easily share data across different data systems within a district (e.g., student information, assessment, transportation, library and health) and to more easily share data between districts and the state, regardless of the vendor or software on which the district system was based. Virginia introduced new interoperability standards to the districts at the same time to make data transfers from schools to districts to the state more consistent and to reduce burden on the districts.

Prior to the development of the new data system, Virginia districts had to submit approximately 50 aggregate data collections to the state. By 2005, the department had incorporated all of those data collections into the new system and all students had unique identifiers.

Postsecondary Connection

Virginia used to have a state law preventing the education department from sharing student-level data with higher education, but recent state legislation now requires the P-12, higher education, and community college sectors to work together to build a P-16 (pre-K through college) data system. As in many states, Virginia’s education department does not collect students’ social security numbers; it assigns and maintains its own identifiers to students. Postsecondary institutions and governing agencies, however, collect and use students’ social security numbers, so students’ records cannot be matched based on a single identifier. A cross-walk system—based on fields such as names, date of birth, gender, etc.—needs to be developed in order to ensure that the correct records from each sector are matched together.

Virginia’s P-16 Council was created in 2005 and is chaired by the state secretary of education. The council is charged with exploring ways to ensure that P-12 students are prepared for college and/or a career upon graduation from high school, to help define college and career standards, and to work with the state’s education department, the community college system, and the State Council of Higher Education for Virginia (SCHEV) to find ways to share data.¹¹

SCHEV has had a student data system since 1992 and also has a data warehouse for reporting purposes. The new P-12 system has been built

completely separate from the higher education system; even the electronic student record exchange systems are different. In hindsight, staff at the education department acknowledge that they should have begun working with SCHEV and other higher education organizations earlier in the process of building EIMS, especially now that work has begun in both sectors around electronic student record exchange.

District Access and Use of Data

EIMS and the web-based data warehouse provide more historical student-level data to teachers and principals than ever before in an easy-to-use format. District staff and the Virginia Department of Education continue to work together to make the data warehouse easy to use with little training and to make sure that it contains easily accessible reports (with data at the district, school or student level) and analyses to inform the work of teachers, counselors and administrators. The types of student- and teacher-level data included in the data warehouse are: results from state assessments (updated weekly), SAT and AP test scores, literacy screening results, exit data, as well as attendance and promotion/retention records.

Future Goals

Expanding the Data

Virginia wants to include additional student-level demographic and program data in EIMS in order to get a more complete picture of its students and to understand the various factors affecting student achievement, especially related to different program areas (such as special education services, bilingual and English language learner programs, and services for low-income students). As the state collects student-level course completion data, they will be added to the data warehouse. In addition, they hope to expand the amount of interoperable data that can be more easily shared across districts and with the state to include additional demographic information, assessment results, student records, and transfer information.

Virginia plans to build a connection with the higher education data system. In addition to work with the P-16 Council, the education department continues to participate in conversations with admissions offices at individual higher education institutions and to develop electronic student record

exchange tools for schools and higher education institutions to use for sharing electronic transcripts.

Expanding Research

The Virginia Department of Education, under the direction of the new executive director of research and strategic planning, is working on a research and evaluation agenda. Along with that agenda comes the work of identifying additional data elements needed for further research and balancing those needs with the desire to limit data reporting burdens for the districts.

As the potential uses of student-level data expand, so do the potential abuses. The state will continue work on establishing data governance policies, both internally and externally, that specify who can have access to which data and how they will be used and reported.

Staying State of the Art

As mentioned previously, Virginia has been on the cutting edge of states developing longitudinal student data systems. Staffers are constantly researching activities involving other states, vendors, and industries in order to ensure that they know about the latest available solutions. As long as the state does not inadvertently add to the burden of the districts by constantly changing or adding new solutions without investigating the true value of the new technology, Virginia should remain a model for other states.

Summary

Kansas and Virginia have been successful in implementing longitudinal data systems due in large part to three factors: the leadership of a data champion or champions, the ability of the state education agency to accomplish a great deal without being micromanaged, and the shared goals for the data system. In Kansas, the chief provided political support to implement a lot of changes at once, and without a lot of legislative involvement and oversight. In Virginia, the governor used his executive privilege to implement a pilot data system to test the concept and garner local and state support. California, however, has not benefitted from a strong data champion who could bring parties together to support the main purpose of the new data system. There are many strong data advocates in California and the state has benefitted from various pieces

of legislation mandating a longitudinal data system, but there is not a strong unified vision of how the system is to be built and used. Staff at the state education agency in California also do not have the ability to work flexibly without excessive oversight. Multiple state agencies and departments have an oversight role and their visions often conflict. The legislature may mandate one project or program, but the department of finance may not agree and may only partially fund it, leaving the department of education staff unable to meet their mandates.

Stakeholders in both Kansas and Virginia, at both the state and district levels, are now seeing the benefits of their new student-level data systems. Among the benefits are:

- Fewer data collections from the districts;
- Improved data quality;
- More current, timely data at the state level;
- The ability to identify more easily graduates, dropouts, transfers;
- The ability to share data across districts, and potentially with higher education;
- Increased savings at the district level (time and resources);
- Better and more use of data at the local level; and
- Better data available for research and evaluation.

Building successful longitudinal data systems involves more than assembling the necessary hardware and software to collect and store the data. The ten essential elements of a robust longitudinal data system identified by the Data Quality Campaign are necessary, but not sufficient.¹² Success comes from making full use of the data in the system.

Kansas and Virginia focused on creating data systems that could inform state and local policy decisions and improve student achievement. This focus gave districts an additional incentive to make sure the data system works and the quality of the data is high. With longitudinal student-level data, teachers can develop individual education plans for their students; principals and district superintendents can use data at the classroom and school level to see if

a particular teacher needs help or if there is a systemic problem in one subject. All education stakeholders can benefit from longitudinal data to inform their actions and decisions, but this will only happen if the data system is set up to enable people to use the data.

Glossary

CALPADS

California Longitudinal Pupil Achievement Data System. Launched by the state in 2002 and expected to be operational in the 2009–10 school year, it will collect such individual student-specific data as socioeconomic status, discipline records, and scores on state assessments.

CSIS

California School Information Services. It oversees the implementation of the unique student identifier and operates the State Reporting and Record Transfer System.

EDS

Enterprise Data System. EDS is Kansas's statewide longitudinal student data system; its launch is scheduled for 2009-10.

EIMS

Education Information Management System. EIMS is Virginia's student data system, whose primary purpose is to create, assign and track a unique identifier for each public school student and to offer data disaggregation capabilities to report a variety of assessment results.

ELL

English language learners. Students learning English as a second language.

FERPA

Family Education Rights and Privacy Act. A federal law that limits access to individual student data to certain parties.

KDOE

Kansas Department of Education.

KIDS

Kansas Individual Data System. Implemented in the fall of 2005, KIDS is the state's integrated pre-K-12 data system. It is used to collect data on student enrollment, programs and assessments.

SCHEV

State Council of Higher Education for Virginia. The council makes public policy recommendations to the governor and general assembly in such areas as budgeting, enrollment, technology needs, and student financial aid.

SOL

Standards of Learning. These are Virginia's expectations for student learning and achievement at all levels (K-12) and in all content areas.

SOL Technology Initiative

Standards of Learning Technology Initiative. Begun in 2000, this state-funded project seeks to improve Virginia student achievement through the use of web-based computer resources.

VDOE

Virginia Department of Education.

Endnotes

- 1 Different states approach the Data Quality Campaign (DQC) survey in different ways: some don't indicate that they have one of the ten elements until their system is fully functional in the area, while others will take credit for having an element planned even if it is not yet up and running.
- 2 Historically, states have built data collections and warehouses or reporting tools in silos; that is, each data collection is self-contained and does not connect to tools in other program areas. The "enterprise"-wide collection and warehouse incorporates data from across the agency into one system, so that data can be connected and analysis of the data can show the relationships between the different program areas.
- 3 Kansas did not claim credit on the 2008 DQC survey for having these elements in place. Staff in Kansas who responded to the DQC survey have stated publicly that they respond conservatively to the survey rather than taking credit for what they cannot yet do.
- 4 Gosa, Kathy. "Building for Enterprise Data Management: The Kansas Approach." Presentation made to the NCES MIS Conference, March 2007.
- 5 Gosa, Kathy. Email communication, September 8, 2008.
- 6 Gosa, Kahty. "Kansas Individual Data on Students (KIDS): The Ongoing Story." Presentation made to NCES MIS Conference, March 2007.
- 7 Kansas State Department of Education: Data Governance Program, Version 2.0., 2008.
- 8 Virginia 2000 Appropriation Act (Item 143 C 11). <http://www.doe.virginia.gov/VDOE/Technology/soltech/LegislativeDocs/item143.htm>
- 9 "Virginia Case Study: Building a Student-Level Longitudinal Data System." Data Quality Campaign, 2006.
- 10 2007 Report to the Governor and General Assembly. Virginia's P-16 Education Council, 2007. http://www.education.virginia.gov/initiatives/P-16Council/P-16_2007Report.pdf
- 11 For more information about Virginia's P-16 Council, see <http://www.education.virginia.gov/Initiatives/P-16Council/index.cfm>.
- 12 Other fundamentals of a robust system include a data warehouse or other repository from which robust reports and analyses can be culled, protection of student privacy, and connection to financial data in order to understand the return on investment of various programs.