

Leveraging ARRA Funding for Developing Comprehensive State Longitudinal Data Systems

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A Vision for Statewide Longitudinal Data Systems

The American Recovery and Reinvestment Act (ARRA) provides several funding opportunities that can assist states in designing, developing, and implementing statewide P–20 education longitudinal data systems. These new and enhanced information systems will enable states to track student progress within and across the secondary and postsecondary education sectors and to link individuals' educational investments with their employment and other post-program outcomes. This brief offers a vision of what these state systems can offer and a set of promising projects that states may wish to consider in responding to ARRA funding opportunities and setting priorities for developing the state longitudinal data systems.

State education agency staff across the country are planning responses to ARRA funding opportunities to build state-level, P–20 longitudinal data systems. To qualify for funding, these systems must be able to compile information on student characteristics and their participation in instructional programs, as well as the history of their progress through the education system. These systems also should allow for associations with other state or federally administered education databases—for example, those used to track adult education, career and technical education, correctional education, or student financial aid awards. And these systems should include elements that can be used to track students as they transition into employment, the military, or advanced career training, both within and across states.

Creating such a comprehensive database requires a fundamental rethinking of how states organize and administer information. It requires shifting to a systemic view that education is a lengthy, often lifelong process that unfolds at different rates and in different ways for individuals. To provide an accurate and useful picture of student progress and outcomes, data systems must be capable of tracking both short-term outcomes and long-term progress to assess where individuals make important transitions, and, if possible, why and how they do so. In short, our P–20 education and workforce sectors are fundamentally intertwined, and the way we collect, store, integrate, and use information should contribute to improving student achievement, and, by so doing, strengthen our nation's economic core.

Federal ARRA funds provide a unique opportunity for states to unify what is currently a fragmented system. Realizing this comprehensive vision cannot be achieved at once, but must be addressed incrementally, in a way that takes advantage of existing capacity, state priorities, and funding opportunities.

Approach to the Grant Applications

State grant applications should advance a vision for your proposed state information system that aligns with federal intent and state needs; it also should detail a strategic process for

achieving your goals. Our suggested approach to the State Longitudinal Data System (SLDS) grant application, in particular, begins with assessing your state's current status with regard to the SLDS program requirements and outlining a long-term plan for accomplishing each requirement. Ideally, your plan will identify objectives, steps, and timelines addressing the ARRA criteria that your state currently addresses either incompletely or not at all.¹ The plan should detail the outcomes you expect to achieve at the end of the three-year grant period as well your strategy for sustaining efforts after the end of the grant. Similar deliberateness will be warranted in responding to other ARRA funding opportunities.

Projects should address unmet SLDS criteria, gaps in fully meeting the criteria, and/or related products and services that help improve policy and practice. To the extent possible, your efforts should leverage existing projects, capabilities, and priorities within your state, whether they are unique to one agency, reflect a local initiative or system, or exist at the state level. SLDS grant applications, in particular, can request up to three years of funding and must describe *clear, defined outcomes* at the end of the grant period that demonstrate the state's progress in providing information services through its education data system.

Proposed projects can represent an array of conditions in the state. They can be efforts that have been conceived—even designed—previously, but were not implemented because of a lack of resources. They can be projects developed by a school, district, or postsecondary institution using local data, but that provide a service that could eventually be expanded efficiently to all schools and institutions through the SLDS. Projects also can represent regional collaborations built upon tangential, regional data collection or upon products and services developed by a vendor to address local or regional information services that could be expanded to a statewide application.

A key aspect of proposed projects is that they *provide a foundation for expansion statewide*, through the state-level comprehensive, longitudinal education data system. Proposed projects should take a value-added approach, enabling the state to provide services more efficiently and effectively and to a broader audience than local efforts could achieve.

Sample Projects That Meet ARRA Criteria for SLDS

The ultimate goal of the SLDS program is to support states in designing, developing, and implementing statewide, longitudinal P–20 data systems that will enable them to collect, administer, analyze, and use data to improve student achievement. The content of state ap-

¹ The ARRA grant request details 7 capabilities that funded projects must meet and 12 required data system elements that must be included. The projects described in this brief can respond to the required criteria.

plications will vary, with project proposals dependent on your state’s political climate, the existing capacity of your state longitudinal data system, and other state-specific issues.

As you work to define projects, we encourage you to consider whether your existing data system has the following capabilities and, if not, whether any or all of the proposed projects might be ripe for consideration in your state.

Expansion of the Reach of Statewide Student Identifiers

Most states have procedures for assigning a unique statewide student identifier to K–12 students that remains with them throughout their educational career. While this identifier supports making longitudinal connections around important data elements, it can be less reliable for connecting with the postsecondary sector, for linking with wage-record data administered by state unemployment insurance agencies, or for matching with other social service agencies. Broader identification processes are essential to creating a sound comprehensive longitudinal data system, and potential state projects could include:

- *Standardizing agency identifier management processes* to define a consistent set of data elements, and comparable fields and definitions, to facilitate secure and reliable cross-agency data sharing. Examples of standardized elements could include state-assigned identifiers, Social Security numbers, names, birthdates, gender, unchanging demographic characteristics, and geographic information.
- *Formalizing matching algorithms* that use combinations of identity management data to link individual records within education and across workforce and other data systems on a reliable, consistent basis.
- *Establishing data exchange mechanisms, protocols, and legal agreements* among data source owners that prevent public exposure of confidential information and that exceed requirements of state and federal law for every data source.
- *Creating processes* that effectively “de-identify” individual-level, cross-agency data residing in comprehensive state data systems. Original identifiable information, needed for matching as data are refreshed, would be maintained in a separate, highly secure environment.

Standardization of Student-Level Enrollment Data

Nearly all states maintain data on K–12 student demographic characteristics, socioeconomic information (primarily around free or reduced-price lunch eligibility), and program participation information (such as special education, English language learning, Title I, dropout

prevention, migrant education, career and technical education, among others).² While the ARRA grant competition requires that states maintain these data system elements for K–12, states could seek to expand these data to include adult and postsecondary elements. Potential projects might include:

- *Consolidating separate programmatic reporting functions* into a shared, single K–12 or P–20 education data system. From a K–12 perspective, this means ensuring that a single comprehensive system addresses the information needs of Title I, migrant education, juvenile justice, special education, and other programs. From a postsecondary perspective, it means expanding the scope of the system to address adult and postsecondary data needs.
- *Linking enrollment data to external data resources* that facilitate determination of program eligibility; for example, linking enrollment data to Temporary Assistance for Needy Families, food stamps, and state aid programs to determine eligibility for free or reduced-price lunch or postsecondary need-based grants.
- *Creating mechanisms to share critical elements* of enrollment data, including individual education plans, immunization records, test scores, and course completion information between schools and districts to facilitate re-enrollment as students move, including between states.
- *Expanding the scope of state enrollment data* to include private, charter, and home schools, and private nonprofit and for-profit postsecondary institutions.

Linking of Education Databases with Student-Level No Child Left Behind (NCLB) Test Data

Nearly all states can link student data to NCLB test results, whether exams are administered by the state agency or through a testing vendor under contract to the state. Generally, states report test results in the aggregate, to track district- and school-level performance, and at the individual student level, to inform teachers about student performance on subject-area tests and strands and sub-strands within subjects. Some also provide teachers with specific item-level responses, while fewer connect individual student test performance longitudinally over time and grade levels. Potential state projects could include:

- *Developing analytic applications for classrooms* that include individual, state NCLB assessment results for prior years, combined with local or other benchmark assessment results for the current year, in advance of the spring administration of NCLB assessments.

² See http://www.dataqualitycampaign.org/resources/arra_programs. This reference includes a complete listing of federal funding sources that can be used for SLDS efforts.

- *Creating predictive applications* using state NCLB assessment results over time, by subject area for key students and student groups, to forecast future assessment performance. These results can be used to plan early intervention efforts to improve student performance. Moreover, such applications could be extended beyond NCLB to ACT or SAT results, high school graduation, and college readiness.
- *Designing facilitated intervention tools* to link individual student assessment results, at the strand and sub-strand levels, with state standards, curricula, and instructional approaches to assist teachers in choosing targeted interventions.

Inclusion of All Students

An important feature of the current requirements of state and federal accountability systems is that they are inclusive—they account for all students regardless of their programs, socio-economic status, and race and gender. Nearly all states monitor and report on these requirements. States could assist district- and school-level monitoring by:

- *Crafting reporting and alert applications* that regularly monitor student-level participation in state assessment programs and provide alerts if key groups of students are excluded or missing.

Statewide Teacher Identifier with Teacher-Student Match

Matching instructors with the students they teach can help link teacher attributes or professional background or development to student performance. Potential state projects could include:

- *Developing analytic or reporting applications* linking teachers to students and providing analyses based on key demographic, subject-area, grade-level, and/or program characteristics that school and district administrators can use to assign teachers based on their performance.
- *Identifying teacher characteristics* associated with high added value for student achievement.
- *Identifying certification routes, professional development activities,* and other elements of teacher preparation and employment that are effective in improving and/or sustaining student achievement.
- *Identifying best practices in teacher preparation* that lead to immediate and stable employment in schools, classroom assignments using the skills learned in the preparation process, and student performance related to teacher preparation.

- *Developing school- and/or district-level performance appraisal processes* including quantified student achievement objectives, among other appraisal components.

Student-Level Course Completion (Transcript) Data

High school course completion information (that is, transcript information) offers important analytic information on student performance to state and local education agencies, as well as provides a direct service to students. On the one hand, transcripts provide detailed information about student course completion useful in assessing preparation for subsequent grades, the workforce, and/or postsecondary education. On the other, they can facilitate enrollment and/or re-enrollment as students move from school to school or to postsecondary institutions. Projects could address one or both of these uses of transcript data and could include:

- *Developing a transcript exchange process* to facilitate classroom placements for mobile, migrant, or displaced students, or for those advancing to the next educational level.
- *Deploying individualized planning tools* comparing a student's coursework at a point in time with the entrance requirements for postsecondary education or careers and offering guidance in planning to meet requirements for courses in the future.
- *Creating analytic and reporting applications* providing information about course taking and completion patterns, disaggregated geographically, demographically, and programmatically.
- *Establishing common course descriptions and nomenclature* to ensure a common taxonomy for transcripts and articulation agreements.
- *Designing transcript evaluation applications* for use by postsecondary education institutions in admissions and placement processes.

Student-Level SAT, ACT, and Advanced Placement Examination Results

The College Board and ACT have provided opportunities for states to enter into agreements allowing the integration of key elements of their assessment offerings into state education data repositories. These include ACT, PLAN, SAT, and PSAT assessments. Assessment results for individual students participating in high school acceleration programs, including Advanced Placement, International Baccalaureate, and the Cambridge AICE, have been obtained in at least one state with appropriate data-sharing agreements. Projects could include:

- *Developing predictive applications* using NCLB and other state assessment results over time, for key students and student groups, by subject area, to forecast future performance

on postsecondary placement examinations in order to facilitate early intervention to improve performance.

- *Creating intervention tools* for use by classroom teachers and guidance counselors linking individual student state assessment results at strand and sub-strand levels to predicted performance on placement examinations in order to promote improvement in predicted performance.
- *Designing analytic and reporting applications* for local and state use that allow monitoring of student participation and performance in postsecondary acceleration programs by key student characteristics and that provide feedback about entrance, persistence, and completion rates in postsecondary education.

Student-Level Graduation and Dropout Data

All states can calculate a cohort, individual-student-based, four-year high school graduation rate based on the progress of individual students moving through high school. A consistently measured set of high school graduation and dropout metrics across the nation is an important step in evolving education data system capabilities. It is the application of these data, however, in promoting high school graduation and identifying successful dropout prevention strategies that is most important. Projects could include developing:

- *Analytic and reporting applications* detailing characteristics of high school dropouts and graduates and identifying early warning signs in elementary and middle school that could serve as a basis for early intervention.
- *Creating analytic tools* to identify successful practices for dropout prevention in schools or districts.
- *Developing additional high school completion metrics* that parallel the standard high school graduation rate and are related to student attainment of special diplomas, certificates, workforce certifications, or GED credentials.

Student-Level Post-High-School Enrollment, Course-Taking, Retention, and Completion Data (including Adult, Career and Technical, and Postsecondary Education)

In 2008, 28 states reported that they had the ability to connect P–12 and postsecondary data.³ It is unclear, however, to what extent state systems contain important elements of postsecondary and post-high-school offerings and promote use of the resulting data. Projects could include:

³ See <http://www.dataqualitycampaign.org/survey/elements>.

- *Developing high school feedback reporting mechanisms* providing schools with follow-up information on their graduates and dropouts regarding participation in postsecondary education, including admissions, enrollment, persistence, and completion. A related mechanism could offer feedback to community colleges on their students' success in four-year institutions. Consideration should be given to connecting secondary and postsecondary coursework in this type of project.
- *Identifying K–12 experiences* associated with higher rates of postsecondary enrollment, persistence, and completion for different student groups, including gatekeeper courses or course patterns and critical NCLB test scores or performance levels.
- *Creating analytic and reporting mechanisms* to fill gaps in a state's postsecondary information for public institutions lacking information systems, non-public institutions, and out-of-state institutions.
- *Designing reporting capabilities for postsecondary institutions*, especially non-public institutions, which could be incorporated into the statewide longitudinal system.
- *Developing tools using cross-sector data* to identify early indicators for secondary students at risk of having to take postsecondary remedial coursework because of their lack of preparation for college-level work. These early indicators would be designed to facilitate early intervention.

State Data Audit System (K–20)

Data quality is an important issue exacerbated by new, large, and complex data systems. It is of paramount importance that all data elements collected are used, publically reported, and result in important information services at all levels. Increasingly, federal audits of federal reporting requirements through EDEN, the Carl D. Perkins Career and Technical Education Act, Adult Education (via the Workforce Investment Act), and the Higher Education Opportunities Act, involve tracing state-reported data to their origin at the local level to determine whether state reports accurately reflect local events and actions. Projects addressing this issue could produce demonstrable improvements in accurate reporting. Projects could include:

- *Creating strategies employing systems* of informational and “pass/fail” edit conduits; cross-verification edits among data elements that should complement one another; cross-checks with external data systems; on-site reporting reviews/audits; and written and telephone follow-up with reporting entities around particular reporting issues.
- *Providing technical assistance* for staff at all levels through local, regional, or statewide conferences with information services and business staff around reporting issues and system changes.

- *Devising recognition strategies* for exemplary reporting practices.

Employment Data

Connecting education data with employment and social services data can be accomplished in several ways. At the state level, quarterly wage and tax reports are integral to states' unemployment compensation programs, and they provide census-like reports of a state's employer payrolls. Such resources as military enlistments, federal career services, and U.S. Postal Service employment files could complement wage and tax records. As in any case where education data are linked to external, non-education resources, there are issues related to FERPA and to laws and regulations pertaining to those external sources. However, states can overcome these challenges by designing projects that include:

- *Creating education feedback reporting mechanisms* supplying employment and earnings data for both secondary and postsecondary students, both while they are in school and after they exit, to help quantify the return on educational investment. Such tools also can be used to assist educators in aligning program planning with state employment trends and projected needs.
- *Negotiating data sharing arrangements* with state occupational licensure and employer certification agencies to identify education program participants who receive industry-recognized or -awarded credentials, certificates, or licenses.
- *Developing career guidance planning tools* to help students plan their secondary and postsecondary programs to meet their specific employment goals. These tools could be combined with postsecondary planning tools discussed earlier.

Social Services Data

Data are often shared as part of local interagency case management involving various systems (such as education, social services, juvenile justice, courts, and law enforcement). Some state systems link education data to data on public assistance, social services, foster children, corrections, occupational licensure, and other agencies. As with all efforts to link data from disparate organizations and business processes, it is crucial that all involved get something useful from the effort. Projects should specifically address how the linked data will afford maximum use for everyone involved. In some cases, this may entail determining how the richness of individual data can be used for reporting and analyses by cooperating parties. Projects could include:

- *Establishing access processes* allowing authorized representatives of partner social service agencies to access individual data in restricted-use systems. Linking information permits

the identification of those receiving multiple services, opening opportunities for more efficient case management and service coordination.

Complementary Projects

Projects in this category could be demonstration projects that enhance the capabilities of the state data system, in addition to the 12 criteria. Such projects could include:

- *Offering state-level services to school districts* lacking the infrastructure, funding, or sophistication to utilize state and local education data fully to improve student achievement. Such services could include digital grade books, education dashboards or portals connecting summative and formative assessments, and/or counseling tools.
- *Developing templates* through state data that districts could use with local data. For example, a template built at the state level that provides a basis for early interventions to prevent dropping out of high school or a template connecting state-level teacher data to student performance data for use in making classroom assignments or conducting teacher evaluations.
- *Creating “P–20 pipeline” success measurement tools* tracking student retention, progression, and completion from at least 7th grade through postsecondary education and into the workforce.
- *Designing and deploying postsecondary consumer reports* based on combinations of high school and postsecondary curricula and student success in the postsecondary course work.
- *Establishing restricted-use policies and processes* for researchers and others who require access to individual-level data.

Project Management and Governance

The ARRA SLDS Request for Applications, in particular, limits grant eligibility to state education agencies. It also asks states to indicate where the project will be located within its organizational structure and identify the entities responsible for the approval and oversight of activities. Although the burden of project management falls on the state education agency, states will need to adopt a set of administrative controls that promote collaboration among various state agencies with different missions and interests.

Ultimately, building a statewide longitudinal data system requires creating a collective vision of project goals, determining a realistic set of outcomes, and establishing a collaborative environment that fosters shared decision-making among partner agencies. Since database design, however, will occur simultaneously within secondary and postsecondary agencies, with each

agency taking ownership of its program data, states will need to agree upon a parallel design process to ensure that final products align and support the flow of information.

Accordingly, in their applications, states should describe their proposed management structure and controls clearly, detailing how organizational partners, within both the state education agency and other related sectors, will coordinate planning and development activities. States also will want to include representatives from local agencies in their project team—such as teachers, college faculty, and workforce representatives—to ensure that project data serve multiple purposes.

In a shared information system, custodians and operators must be sensitive to the sense of ownership, data knowledge, and business knowledge of those providing access to data resources. The degree to which sharing arrangements can serve the information needs of state and local levels will depend upon the enthusiastic support of all participating organizations. Regardless of how the shared system is conceived—as a single data warehouse, a distributive system providing conduits to original data, or some combined approach—its operation should be governed by a board of directors comprised of data owners, business interests, and other key users.