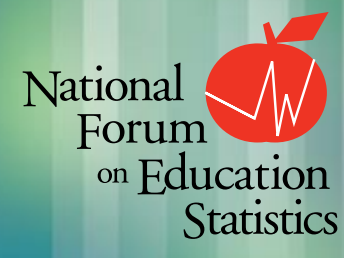
TRAVELING THROUGH TIME

The Forum Guide to Longitudinal Data Systems

What is an LDS?



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National Cooperative Education Statistics System

The National Center for Education Statistics (NCES) established the National Cooperative Education Statistics System (Cooperative System) to assist in producing and maintaining comparable and uniform information and data on early childhood education and elementary and secondary education. These data are intended to be useful for policymaking at the federal, state, and local levels.

The National Forum on Education Statistics (the Forum), is an entity of the Cooperative System and, among other activities, proposes principles of good practice to assist state and local education agencies in meeting this purpose. The Cooperative System and the Forum are supported in these endeavors by resources from NCES.

Publications of the Forum do not undergo the formal review required for products of NCES. The information and opinions published here are those of the Forum and do not necessarily represent the policy or views of the U.S. Department of Education or the National Center for Education Statistics.

July 2010

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The Forum World Wide Web Home Page is *http://nces.ed.gov/forum*

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Foreword

The National Forum on Education Statistics (the Forum) is pleased to present *Traveling Through Time: The Forum Guide to Longitudinal Data Systems*. This document, *Book One of Four: What is an LDS?*, is the first installment of this Forum series of guides on longitudinal data systems (LDS). One goal of the Forum is to improve the quality of education data gathered for use by policymakers and program decisionmakers. An approach to furthering this goal has been to pool the collective experiences of Forum members to produce "best practice" guides in areas of high interest to those who collect, maintain, and use data about elementary and secondary education. Developing LDSs is one of those high-interest areas. These systems hold promise for enhancing both the way education agencies use data to serve students and the way they do business, from the policy level to the school office and into the classroom.

LDSs are increasingly becoming the state of the art in education data. These systems move us from relying on blunt, aggregate, snapshot student data; to detailed and timely, student-level data that reflect the student's entire academic history. An LDS makes it possible to not only monitor the success of individual students, but also to identify trends in those students' education records. Freeing educators from guesswork and lessening the burden of painstaking data analysis, these systems provide powerful and timely insight about students and allow educators to tailor instruction to better meet individual needs. An LDS can reveal with great clarity what effects our policies, programs, and decisions have on schools. These systems allow agencies to track students across institutions to facilitate appropriate course placement and to determine who has transferred and who has dropped out. Longitudinal data systems also offer a new level of sophistication at the business level that can streamline operations; improve data quality; and free up valuable resources previously allocated to inefficient data entry, maintenance, and reporting practices.

For these and others reasons, states should continue to introduce, develop, and expand their LDSs. The *Traveling Through Time: The Forum Guide to Longitudinal Data Systems* series is intended to help state and local education agencies meet the many challenges involved in developing robust systems, populating them with quality data, and using this new information to improve the education system. The series will introduce important topics, offer best practices, and direct the reader to additional resources related to the LDS development process. In sum, it is intended to help agencies establish LDSs that will have lasting, far-reaching impact on the education system and students' lives. For a description of the entire guide series, see appendix A.

Book One of Four: What is an LDS?

This first book in the guide series focuses on the fundamental questions of what an LDS is (and what it is not), what steps should be taken to achieve a sound system, what components make up an ideal system, and why such a system is of value in education.

- **Chapter 1** introduces this guide series, discussing its purpose, format, and intended audience.

- **Chapter 2** covers some LDS basics, defining the concept of a "longitudinal data system" and laying out key nontechnical steps to planning and developing a successful system.
- **Chapter 3** presents the technical components that generally comprise an LDS, as well as some additional features that may enhance the system.
- **Chapter 4** addresses some common misconceptions regarding longitudinal data systems.
- **Chapter 5** discusses the overarching benefits of an LDS.

The appendices include an overview of the four books in this guide series, references, additional resources, a handout summarizing key LDS components, excerpts from LDS-related federal legislation, and other relevant Forum and NCES resources.

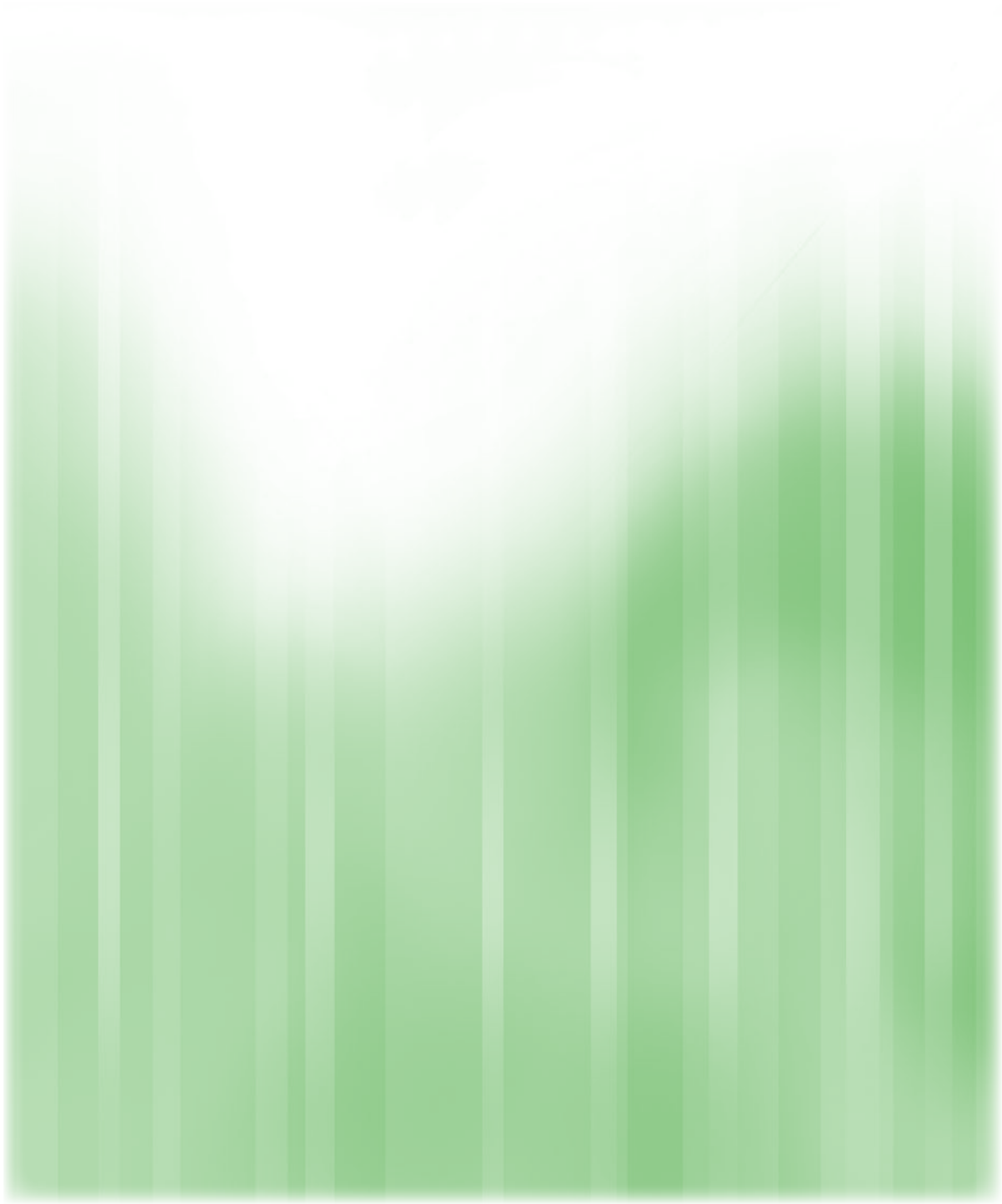
The National Forum on Education Statistics

The work of the Forum is a key aspect of the National Cooperative Education Statistics System (the Cooperative System). The Cooperative System was established to produce and maintain, with the cooperation of the states, comparable and uniform educational information and data that are useful for policymaking at the federal, state, and local levels. To assist in meeting this goal, the National Center for Education Statistics (NCES), within the U.S. Department of Education, established the National Forum on Education Statistics (the Forum) to improve the collection, reporting, and use of elementary and secondary education statistics. The Forum deals with issues in education data policy, sponsors innovations in data collection and reporting, and provides technical assistance to improve state and local data systems.

Development of Forum Products

Members of the Forum establish task forces to develop best-practice guides in data-related areas of interest to federal, state, and local education agencies. They are assisted in this work by NCES, but the content comes from the collective experience of the state and school district task force members who review all products iteratively throughout the development process. Documents prepared, reviewed, and approved by task force members undergo a formal public review. This public review consists of focus groups with representatives of the product's intended audience, review sessions at relevant regional or national conferences, or technical reviews by acknowledged experts in the field. In addition, all draft documents are posted on the Forum website prior to publication so that any interested individuals or organizations can provide feedback. After the task force oversees the integration of public review comments and reviews the document a final time, publications are subject to examination by members of the Forum standing committee sponsoring the project. Finally, the entire Forum (approximately 120 members) reviews and formally votes to approve all documents prior to publication. NCES provides final review and approval prior to publication.

Contents



Chapter 1

INTRODUCTION

Across the country, state and local education agencies are developing longitudinal data systems (LDS); some are just getting started while others explore ways to grow or better harness systems that have been in place for years. The federal government first endorsed LDS development in the No Child Left Behind Act of 2001.* It has since provided grants through the Institute of Education Sciences (IES) of the U.S. Department of Education (USED), which has helped many states in their LDS development efforts. The federal government has also advised states to "(build) data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction," which is an eligibility requirement for Race to the Top funds under the American Recovery and Reinvestment Act of 2009.

Vendors are offering a growing number of products and services to facilitate the collection, storage, and use of longitudinal data. Additionally, a number of national organizations are providing support for LDS development efforts, or working to communicate the need for, and benefits of, these data systems. By facilitating the collection and use of high quality student-level information, LDSs hold promise for enhancing both the way we use data to more effectively serve our students; and the way we do business, from the policy level, to the school office, and into the classroom.

What is the Purpose of these LDS Guides?

Many challenges stand in the way of building a good LDS, achieving high quality data, and using this new information effectively. These guides were developed to help state and local education agencies overcome these obstacles and efficiently plan, build, and/or improve their LDSs. Each book in the series offers guidance for developers at various levels of an education agency, providing both an overall perspective and a close-up view. The scope is broad, covering a wide range of key concepts and activities, offering best practices

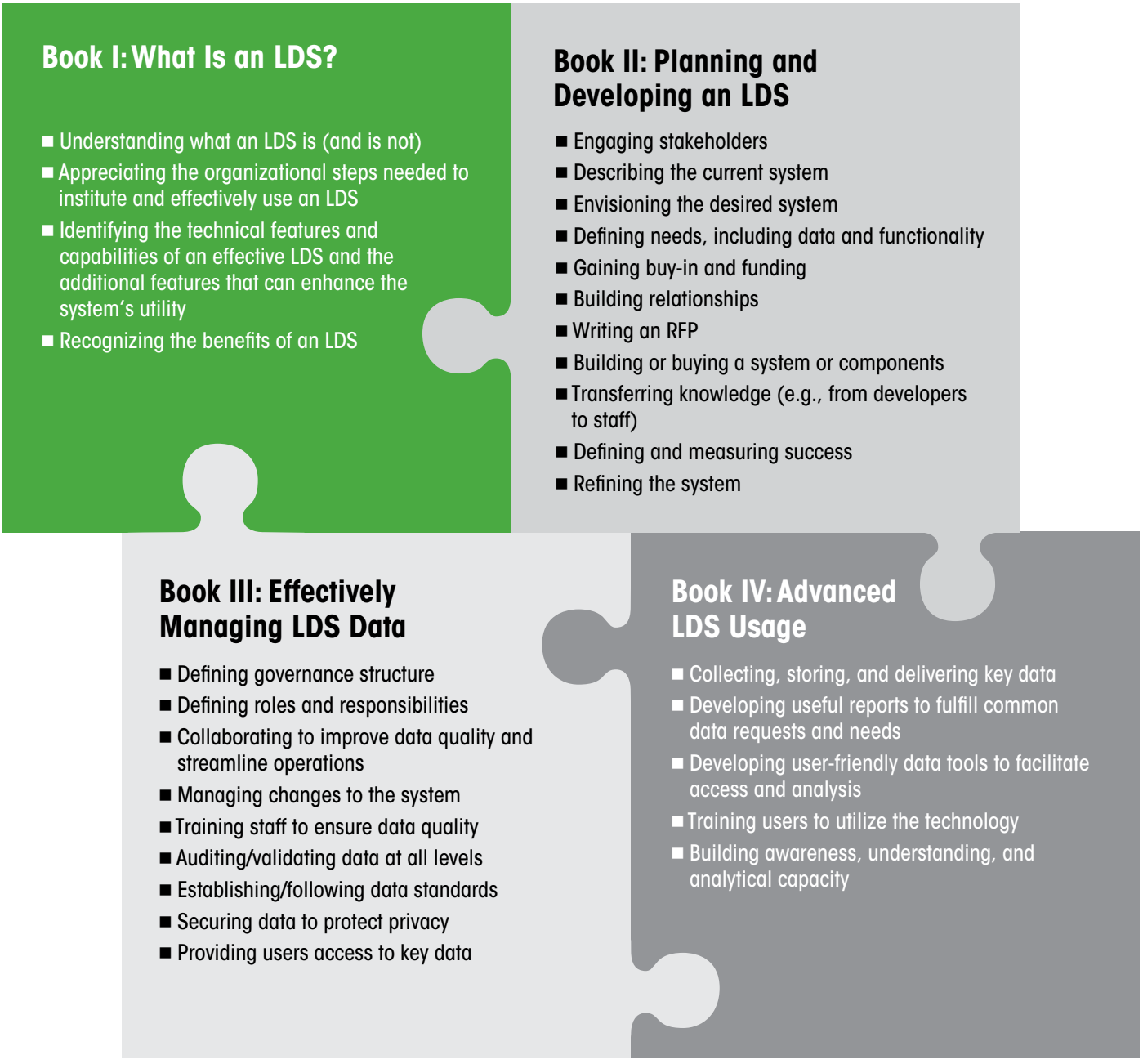
The goal of this guide series is to help education agencies overcome obstacles and effectively plan, build, and/or improve their LDSs.

*Title I, Part A, Section 1111(b), subsection 3(B) of the law states that "each state may incorporate the data from the assessments under this paragraph into a state-developed longitudinal data system that links student test scores, length of enrollment, and graduation records over time."

and lessons learned from state and district staff, and noting procedural and structural benchmarks for an organization to reference throughout the planning and development process.

In reality, there is no one way to build an LDS and no two such systems are alike. Each education organization takes its own path to its own version of an LDS, fulfilling its own specific set of goals. For example, some agencies will build a data warehouse, while others will not; some will hire vendors, while others will do the work in-house. Thus, these guides do not present a rigid list of steps that must be followed in order to develop a

Figure 1. Summary of the Forum Guide to LDS Series



successful LDS. Rather, this series is intended to provide readers with thought-provoking questions and concepts in order to build solutions that meet their organization's specific challenges and needs.

With special emphasis on the business-level perspective, these guides address many issues to consider about planning, developing, and maximizing the benefits of an LDS. Agencies should establish a process of data governance to ensure that the data they collect will be of high quality. These guides also cover the need to carefully plan the system in detail, gathering input from all interested parties, constructing a sound foundation, building upward, and putting the system to good use.

How to Read the Guides

Readers should feel comfortable making their way in order through the four books in this series. However, as states and districts may not be at the same stage in the LDS development process, each book and chapter has been developed as a stand-alone piece. This structure allows readers to skip sections that address work already completed and focus on project phases that lie ahead. Of course, readers may also review past and current work in light of those earlier sections. Figure 1 (opposite page) lays out the major issues discussed in each of the four books in this series.

An additional goal of this series is to offer a broad and accessible source of information to anyone involved in LDS development. See the Additional Resources appendix at the end of each guide for outside sources that offer more detailed information.

Who Should Read These Guides?

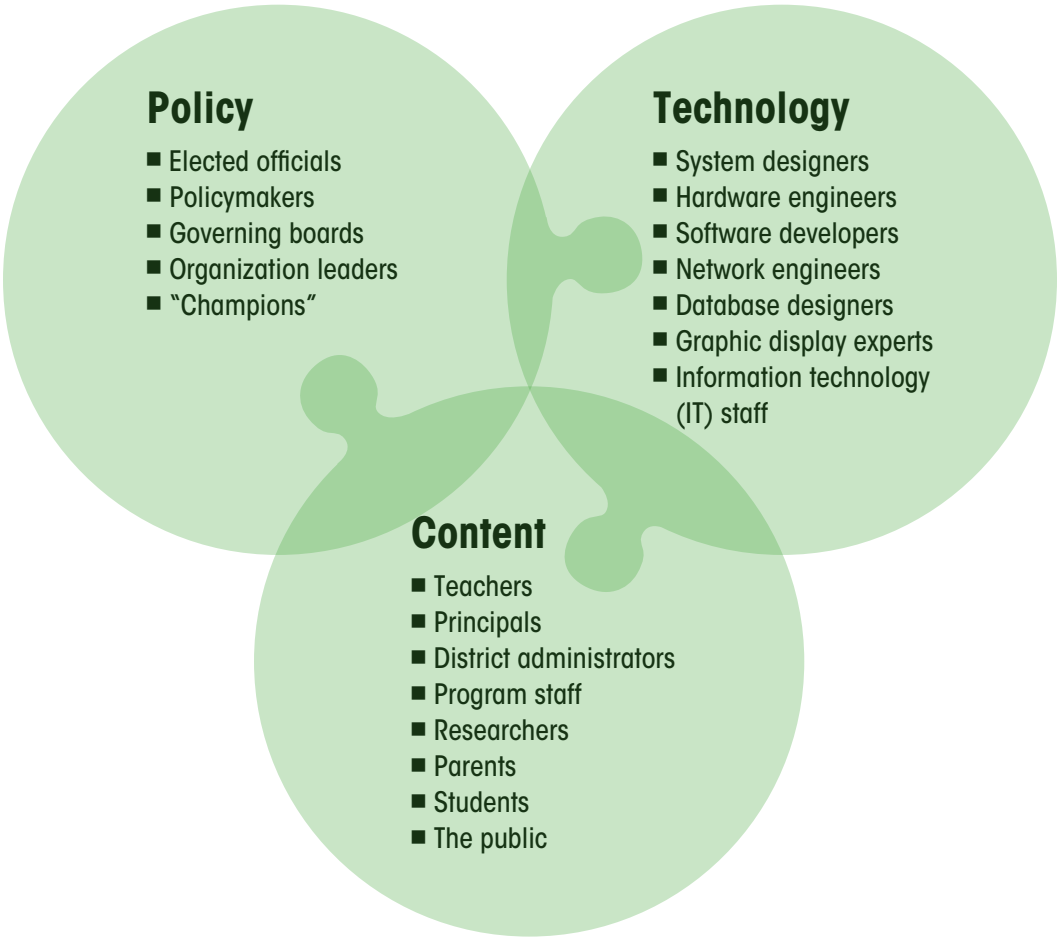
District difference

While this series generally focuses on state-level systems, the majority of the information also applies to district-level LDS efforts. Key differences between state and district LDS requirements, as well as best practices, are highlighted in boxes like this one.

While these guides aim to serve anyone involved in developing or using an LDS at the state and district levels, they were written with three key perspectives in mind: policy, content, and technology. Each of these perspectives roughly corresponds with an audience group instrumental in the effective design, implementation, and utilization of an LDS. These groups could be generally categorized as decisionmakers, users, and system designers, respectively. The needs and interests of these groups overlap somewhat, especially in terms of system use. In many ways, however, these audiences' perspectives differ in terms of what an LDS is and what value such a system offers. System designers focus mainly on the nuts and bolts of building the various system parts. Decisionmakers and other system users are

more interested in the end products–the data–that they will be able to use for research and decisionmaking. While these differences can be beneficial to the successful development of an LDS–bringing a variety of perspectives, knowledge, and expertise to the table–effective collaboration and communication among these groups will be vital. By viewing an LDS holistically, this series seeks to bring the various groups to a common understanding of these systems and to clarify the roles of each in the development process. To that end, these guides will focus on areas where the stakeholders' needs and interests overlap, while also addressing language gaps that exist between them. Figure 2 illustrates the three primary perspectives and associated groups addressed in this series.

Figure 2. Three primary LDS perspectives and their associated audience groups



The policy audience group

Decisionmakers and others who view an LDS from a policy perspective drive the mission and create the vision for the project. This group's members provide policy guidance, funding, and political leadership by sponsoring the development of effective education

information systems and deciding if the final product will be a good investment of funds, whether federal, state, local, or private resources. They need to ask key questions up front about the system's desired functions and the decisions it should help them and other users make, from policy to instruction, as well as develop a clear plan for those who will create the system. This group includes elected officials, policymakers, governing boards, and organization leaders. It also includes "champions"–those who drive the LDS effort and work to create buy-in and win support for the system–who must see the big picture as well as understand the development process. These decisionmakers must also understand what their ongoing role in LDS development will be. Additionally, since they may also become system users once detailed, longitudinal data are available, they must know and convey what data need to be included to meet their information needs. This series will help this audience group establish a vision, mission, and expectations for their LDS.

The content audience group

Those who view the LDS in terms of content span a broad range of system users. This category includes individuals who drive the implementation of the policymakers' plans by helping to identify the questions the LDS should answer, and which data elements will be needed to answer these questions. This group comprises the program area staff, such as special education services, Title I, English Language Learner programs; school and district administrators, including principals, directors, and superintendents; and human resources staff who oversee LDS implementation, help define the requirements, provide professional development, and monitor the use of the data. Members of this group provide insights about education processes, the use of information in creating and enhancing educational assessments, and the effective teaching of all students. This broadly defined group also includes researchers and other data consumers, such as teachers and administrators; and even parents, students, and members of the public, many of whom may be involved in the design process and need to know what to do with the data when they become available. While the decisionmakers may determine whether the development of an information system was a good investment, this broader group of system users (which includes decisionmakers) will determine if the information is useful for improving education–either by utilizing or ignoring it. These guides will define this audience group's unique requirements to help its members fulfill the decisionmakers' vision, mission, and expectations for the LDS.

The technology audience group

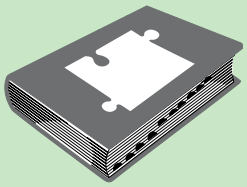
System developers who view the system from a technology perspective, these are the hardware and software experts who make the LDS "work." System developers, or builders, provide understanding of the strengths and weaknesses of information technology, as well as the developmental trends in technology and information management tools and processes. This group includes project managers, hardware engineers, software developers, network engineers, database designers, and graphic display experts. The system developers may know little about the processes of education, policy, or the information needs of the stakeholders who will ultimately use the system; but without their expertise, the effective

and efficient storage and manipulation of education data would be impossible. Focused on the nuts and bolts, they build the system details and want to know how the data are to be housed, secured, and maintained. This series will enable this group's members to meet the unique requirements of the education data community.

Conventions

Throughout this series, important terms and topics will be highlighted in sidebars. Notable subject matter will be easily identified by the following icons:

Definitions



LDS lore (fictional tales)

Key points

Bright ideas

Tips

District difference

Chapter 2

LDS Basics

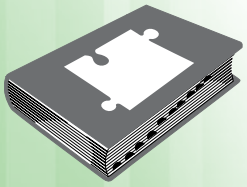
What exactly is a "longitudinal data system" (LDS)? An LDS will vary from one organization to another, as will its perceived value. Furthermore, misconceptions about these systems abound, as detailed in chapter 4.

Defining "Longitudinal Data System"

In order to get everyone who is involved in the development process on the same page early on, this guide series uses the following definition:

An education longitudinal data system (LDS) is a data system that

- collects and maintains detailed, high quality, student- and staff-level data;
- links these data across entities and over time, providing a complete academic and performance history for each student; and
- makes these data accessible through reporting and analysis tools.



An education longitudinal data system is a data system that collects and maintains detailed, high quality, student- and staff-level data that are linked across entities and over time, providing a complete academic and performance history for each student; and makes these data accessible through reporting and analysis tools.

Though system characteristics and capabilities vary (see chapter 3), this definition captures what many experts agree is the standard for an LDS.

Putting the "L" in LDS

by Nancy Smith* (2008)
Reprinted with permission from the Data Quality Campaign (DQC).

So what is an LDS? What makes it longitudinal? Many states and districts think that they have a longitudinal data system because they have a data warehouse that has many years worth of data. Others don't have a data warehouse, but do report many years worth of annual graduation rates. So, they say that they have an LDS. Others believe that they have a longitudinal data system because they have a student identifier system.

Longitudinal means that data on a given student can be connected across years. In photography parlance, it is more like being able to watch a video of a student as (he or she goes) from grade to grade. If you put all those videos of individual students together into a montage, you can usually spot some trends about what happens to students with different types of experiences in the early grades. Usually, though, school districts and state education agencies (SEAs) review "snapshot" data—pictures taken of a given 3rd grade class one year, the 4th grade class the next year, and the 5th grade class the third year. Some of the same students might be in all three pictures, but it is more likely that some students leave and others join the cohort over the three-year period.

In years past, it was more common for school districts to send summary statistics to the SEA—for example, the count of students receiving special education services or free- or reduced-price lunch, the percentage of students passing that statewide exam in the spring, or the number of students in each racial/ethnic category. The SEA could then aggregate or add up all of the school or district numbers to get statewide totals. Aggregated snapshot data are very valuable to educators and policymakers, especially when they need a way to quickly summarize how schools are performing and see which districts serve which types of students.

However, snapshot data alone do not provide enough information to truly evaluate the impact of student mobility or of dropout intervention programs, the relationship between course-taking patterns and college-readiness, or the ability to calculate a graduation rate while taking into account students who transfer to another school, are retained in a grade, leave for private school or drop out. Only a set of robust longitudinal data on the characteristics and experiences of each student—that tracks students across school years and across campuses within a state and connects that enrollment data with other outcome data (course completion, college readiness, assessment and exit data)—

*Then Deputy Director of the Data Quality Campaign.

provides the ability to thoroughly investigate the patterns of success and struggle that students experience. Student-level longitudinal data can be aggregated to look at school, district and state trends, but they can also be analyzed at a much finer level of detail than snapshot data to fully understand the relationships between the many factors affecting student achievement.

With the snapshot data that is reported per No Child Left Behind requirements, it is possible to say, for example, that 51 percent of African-American students were proficient on the 10th grade mathematics exam, while 83 percent of White students were proficient. With student-level longitudinal data, it is possible to say that of the 51 percent of African-American students who were proficient on the 10th grade mathematics exam, 65 percent of them were also proficient on the 8th grade mathematics exam; and, of those students, 78 percent took algebra I in the 8th grade. With that information, educators and policymakers can understand the importance of preparing students to take algebra I in 8th grade. This type of longitudinal data shows that students who do not take algebra I in the 8th grade are less likely to show proficiency on future exams. With this information, administrators can tailor their curricular activities in earlier grades to prepare more students for algebra I in the 8th grade. Of course, with longitudinal data, the same administrators will also have the data necessary to determine which elementary and middle school students are on track to take algebra I in the 8th grade and provide the necessary intervention to those who are not yet ready but could get there.

Data warehouses (or alternatives) and easily accessible reporting and analysis tools are critical to improving the use of data in education. They are very useful and important tools, even when they are full of snapshot data and statistics. Having these tools, however, does not automatically imply that the state collects student-level longitudinal data, or that they are using longitudinal statistics to inform their decisionmaking.

Longitudinal data implies the ability to collect many key pieces of data on individual students (examples include: campus of enrollment each year, programs in which the student receives services, ethnicity, age, statewide and end-of-course exam scores every year, reasons for not taking statewide exams, college-readiness test scores, and exit status [graduate, dropout, transfer, home school]); connect all those pieces; and then aggregate across students according to a set of key variables in order to analyze the impact of, and relationship between, variables. This ability to analyze and predict performance at the student level is what will ultimately help educators and policymakers at the local and state levels improve the policies that will eventually lead to improved student achievement for all students.

What Steps Should an Organization Take to Reach LDS Success?

While an LDS is often defined by its technical components and capabilities (see chapter 3), an effective system involves much more than expanded technology and data collections. Designing and building a robust LDS for long-term use must also address many nontechnical processes. These processes require the support and engagement of key stakeholders outside of the IT department, both within and outside the education agency.

The following nontechnical activities or "steps" do not have to be accomplished in any particular order, but long-term success requires they all be completed. Each of these steps is addressed in detail in this series.

- **Establish data governance**
  An LDS is only as good as the data it contains. To ensure data quality, develop a data governance process and structure for setting standards and policies, organizing staff, creating oversight committees, and identifying clear roles and responsibilities. Ideally, this should be the first step in the LDS implementation process, ensuring that the data in the LDS will be appropriate and reliable and, in turn, trusted and effectively used throughout the education community.

- **Engage stakeholders**
  A successful LDS will meet the needs of a wide variety of users. Involve a broad range of stakeholders to gather feedback about information needs, inform system design, and build grassroots interest in the planned system. Engage interested parties from inside and outside the education agency to create a vision; identify key policy, political, and instructional questions that the LDS will answer; and articulate reporting needs and potential new uses of data.

- **Identify data "champions"**
  Over time, there will be fluctuations in resource availability and changes in political leadership. To ensure long-term support and sustainability, building both high-level and grassroots demand for the system is critical. In addition to engaging stakeholders, identify "data champions" within the agency and among state policymakers. These champions can help build support for the system, locate sources of start-up and maintenance funds, and develop a culture of data use in which data are valued as assets in the effort to improve education at all levels of government.

- **Conduct self- and needs-assessments**
  Agencies must know why they want an LDS and what stakeholders need from the system. Before building or buying an LDS, assess your agency's current data system, data assets, and data use; and review your organization's structure and resources to determine what needs to be done to get the desired system. The needs assessment should result in a document that addresses specific technical requirements, recommendations for organizational structure changes, and/or recommendations about governance processes. Take the time to gather stakeholder input, as well as lessons learned and best practices from other agencies that are further along in the process.

Provide professional development and training

Create a plan for providing professional development and training to key stakeholders in order to ensure appropriate and effective, long-term use of the LDS. Review internal staff skill sets and external options for modes of instruction, and identify funding sources for ongoing training. This vital step will ensure that users are not only able to use the system to access and analyze the data, but also that they will understand how to better interpret the results.

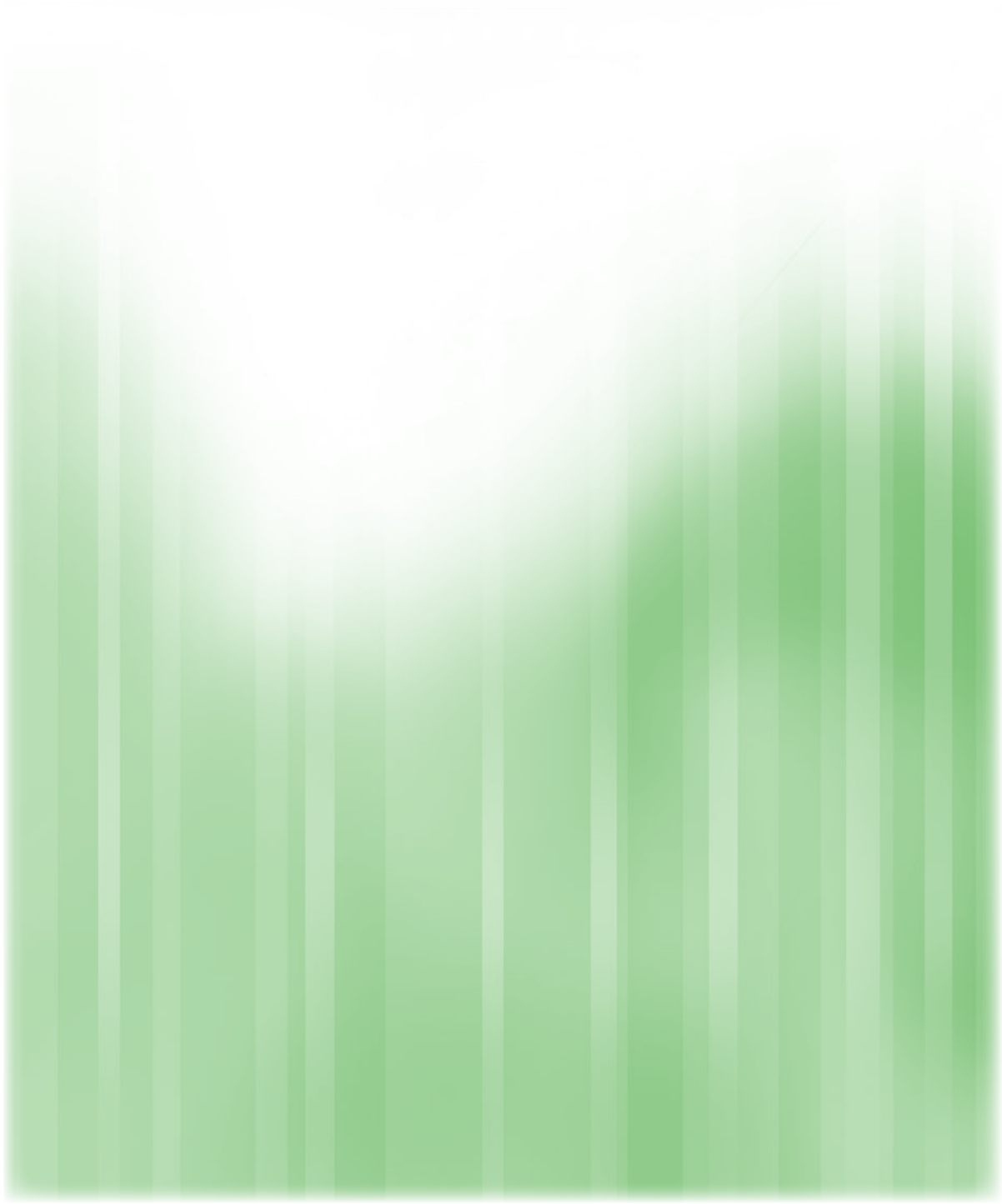
Use the data to improve education

During the LDS planning stage, involve potential LDS users to identify key questions that educators, policymakers, and practitioners need answered to improve student achievement. This step should identify the best methods for producing timely, useful data for a variety of stakeholders, including legislators, state agency staff, local administrators, educators, researchers, parents, and students. Having planned the system to meet the needs of these end users, and having trained these users to make the most of the new data, the new information will more likely be utilized to improve the education system and the educational outcomes of individual students.

The many monikers of LDSs

The concept of a longitudinal data system (LDS) has been given many names in education, business, and IT literature. No matter what moniker you choose, however, the key factor common to these systems is student-level, longitudinal data that can be tracked over time and across institutions. LDSs have been called

- enterprise education information systems;
- longitudinal data streams;
- longitudinal education information systems;
- longitudinal student data systems;
- state data managers;
- statewide longitudinal education data systems;
- student-level longitudinal data systems; and
- statewide student unit record systems.



Chapter 3

What Does an LDS Look Like? From Real to Ideal

Longitudinal data systems (LDS) come in many different shapes and sizes. While all basic systems should share a number of fundamental characteristics, the specific features and the paths taken to implement them will differ among states and districts. LDSs are often conceived and built over time, in a piecemeal fashion, with the consequence that "real" systems are not always "ideal." When possible, therefore, the system should be planned carefully from the outset, with an overarching design intended to meet specific state or local needs and goals. The best approach is to use the organization's questions and desired functionalities to drive LDS design, and the system's various components and functions should be seen as means to desired ends, not ends in and of themselves.

This chapter presents the spectrum of LDS features, including core components and characteristics a well-designed LDS must have ("basic"), as well as attributes that can transform a basic system into a high performance one ("expanded"). While the "basics" will meet the common, core goals of a P–20 LDS, the "expanded" components provide greater efficiencies and capabilities. Attaining all of these characteristics may be challenging technologically, politically, and financially–but well worth the effort in terms of functionality and benefit to stakeholders. As time passes, components once viewed as "extra" or "nice-to-have" (for example, linkages between P–12 and postsecondary and workforce data systems) become the norm as agencies advance in their LDS development efforts.

Many of the features listed in table 1 were drawn from the Data Quality Campaign (DQC, *http://www.dataqualitycampaign.org),* which has been a leader in encouraging LDS implementation; however, many others agree that these are key features and capacities.

Table 1. Basic and expanded LDS features

Basic Features	■ Student unique identifier system ■ Student data (enrollment, attendance, demographics, and program participation) □ Student-level college readiness test scores □ Information on untested students □ Student-level transcript and detailed course-taking information □ Student-level graduation and dropout data ■ Annual summative assessment data links from year to year ■ Teacher unique identifier system and ability to link teacher and student data ■ Teacher and staff data ■ Data warehouse ■ Reporting and analysis tools ■ Interoperability ■ Portability ■ Privacy protection ■ Data sharing beyond K–12 (P–20) □ Early childhood education □ Postsecondary □ Workforce ■ Data audit system to assess data quality, validity, and reliability
Expanded Features	■ Interim and formative assessment data ■ Linkage to finance data ■ Linkage to facilities data ■ Data sharing with Social Services ■ Role-based stakeholder access via web-based portals ■ Other data ■ Geographic information system

Basic Features

To achieve "basic" functionality, an LDS will include the following core elements, components, and capabilities:

Student unique identifier system

A student unique identifier system is the basis for an LDS. Without this component, tracking students over time and space will be exceedingly difficult, if not impossible. A unique statewide student identifier is "a single, nonduplicated number that is assigned to, and remains with, a student throughout his or her P–12 career (and beyond). Assignment of a unique statewide student identifier to every student in the P–12 system provides a way to follow students as they move from grade to grade, and across campuses and/or districts within the state. (Using the student identifier to track student participation and performance) can help show

- the academic value-added of a school or program;
- the achievement levels in early grades that indicate that a student is on track to succeed in subsequent grades; and
- the test scores in early grades that should be thresholds for intervention." (DQC 2009)

Ideally, the unique identifier should follow the student from early childhood through postsecondary education, and even across state lines. Of course, coordination across the education system is necessary to maintain a single, unique identifier that will stay with each student throughout his or her education.

District difference

At the district level, an LDS may contain two unique identifiers for a single student: a local identifier and a state-assigned one to enable integration with the statewide system.

Making sure that students are consistently identified by the same number over time can be complicated by several challenges, including the existence of both state and local identifiers, inconsistent reporting by students, clerical errors, and student transfers across district or state lines. Though a unique identifier system has been implemented in most states, some still require that districts collect Social Security Numbers (SSN) as a secondary form of student identification. The collection of SSNs heightens concerns about student privacy; however, the SSNs can be stored in a secure electronic system and used only when needed to improve consistency and record-matching; and to facilitate broader data sharing beyond P–12, since the SSN is commonly used by postsecondary institutions and other government agencies.

Student data

Accurate information on individual students such as enrollment, attendance, demographics, program participation, and performance are critical components of an LDS. These data make it possible to understand the characteristics of student populations; and to follow students as they move through the education system, from grade to grade and school to school. Accurate data on students allow system users, such as policymakers and educators, to evaluate the impact of programs and other educational inputs (teachers, textbooks, curricula, etc.) on student achievement and outcomes, as well as the other factors that may affect learning (student mobility, English language learners, poverty, etc.). (DQC 2009)

Student-level college readiness test scores

"To ensure that students make a successful transition from high school to postsecondary education, it is important for (agencies) to collect and report student performance data on college admissions, placement, and readiness tests. Student scores on SAT, SAT II, ACT, Advanced Placement (AP), and International Baccalaureate (IB) exams are important indicators of students' college readiness; (agencies) should collect and report these data on an annual basis. With student-level college readiness test scores (added to longitudinal student records), policymakers and educators will know:

- how participation rates and scores on SAT, ACT, AP, and IB exams change over time for low-income and minority students;
- the percentage of students who meet the proficiency standard on the state eighth grade test who also take AP or IB courses in high school and pass the corresponding AP or IB exams; and
- the percentage of low-income students who meet the proficiency standard on the state high school test who take the SAT and ACT exams and score at college readiness benchmark levels on those exams." (DQC 2009)

Information on untested students

Education agencies "need to go further than tracking students who do not take the test to find out why they are not tested, and then match those records to separate enrollment and program participation databases. This makes it possible to identify patterns associated with specific student populations (e.g., special education students or English language learners) and ensure that all students are held to high expectations. With information on untested students, policymakers and educators will know:

- which students were not tested by grade and subject and why;
- trends over time in the number and percentage of untested students from each student group (English language learners, special education students, different ethnic groups, etc.);
- whether or not particular schools and districts have excessive absences on test day or questionable patterns of absences and exemptions across years (these measures can be used in a state's data audit system to ensure data quality)." (DQC 2009); and
- whether the same students are excluded from testing over time, and why.

Student-level transcript and other detailed course-taking information

An LDS should include data commonly found on student transcripts, as well as other more detailed course-taking and outcome information. This should include current course enrollment and courses taken, grades, and credits earned; and may also include information that allows the student data to be linked with teachers, such as course sections or instructor information. These data can inform research, program evaluation, and decisionmaking. They also create student-level transcripts that accompany students as they move through the education system.

"With student-level transcript information, policymakers and educators will know:

- the number and percentage of students who are enrolling in, and completing, rigorous courses in high school, disaggregated by ethnicity and income status;
- the middle schools that are doing the best job of preparing students for rigorous courses in high school;
- whether or not students in more rigorous courses in high school have been more successful in college or in the workplace; and
- whether or not there is evidence of grade inflation (e.g., students with the same test scores receive dramatically higher grades in the same course in certain schools or districts)." (DQC 2009)

This same data collection and analysis will also provide insight into course and program effectiveness at the district level.

Student-level graduation and dropout data

"A majority of states currently collect annual records on individual graduates and dropouts, but to calculate the graduation rates defined in the National Governors Association (NGA) compact, (state or local agencies) need to be able to track individual students over time. The calculation of accurate graduation rates also requires the ability to accurately account for what happens to students who leave public education. For example, (agencies) must be able to distinguish correctly between departing students who drop out or get a GED (General Education Development) from students who transfer to another school. With good graduation and dropout data in place and the ability to match records to other databases, policymakers and educators will know:

- when and why students leave the state's public education system;
- the percentage of first-time ninth graders in a given year who graduate from high school within four, five, or six years;
- the schools and school systems that are doing the best job reducing the dropout rate; and
- the characteristics of high school dropouts and whether or not there are early warning signs that schools can look for in elementary and middle school." (DQC 2009)

Annual summative assessment data links from year to year

District difference

At the district level, there may also be assessments that are locally mandated, locally created, and locally used. While these may not be related to state assessments, they are of great value to local educators, especially when they can be linked over time to create student performance histories.

"A statewide database of individual student performance on state exams (and state-mandated local exams) should be maintained with the ability to disaggregate the results by individual item and objective, in order to provide good diagnostic information to teachers. Though most states do have annual test records for individual students, only some of these states have created the ability to match records for individual students across time and with other databases (e.g., enrollment, course completion, and graduation databases). With the ability to match individual student test records across years to follow student progress, policymakers and educators will know (by grade and subject):

- the percentage of last year's below-proficient students who met the state's proficiency standard this year, and
- whether or not proficient and advanced students are achieving at least a year's growth every year." (DQC 2009)

Teacher unique identifier system and ability to link teacher and student data

"Many (agencies) collect data on teacher education and certification, but matching teachers to students by classroom and subject is critical to understanding the connection between teacher training and qualifications and student academic growth. Collecting these data makes it possible to identify which students and which courses are being taught by teachers with different levels and types of preparation or certification, and which forms of teacher training and certification have the greatest impact on students' academic growth in the classroom. With a teacher identifier and the ability to connect teacher and student data, policymakers and educators will know:

- the teacher preparation programs that produce graduates whose students have the strongest academic growth;
- how the experience levels of the teachers in the district's high-poverty schools compare with those of teachers in the schools serving affluent students, and how these experience levels are related to the academic growth of the students in their classrooms; and

- the relationship between the performance of the district's low-income students on the state algebra exam and teacher preparation in that subject." (DQC 2009)

Teacher privacy must be protected when these links are made.

Teacher and staff data

"Connecting student information with teacher preparation, instructional practices, professional development and working conditions is essential to understanding how and why teachers are able to improve student outcomes." (Berry, Fuller, and Reeves 2007) Linking student and staff data is of limited value unless accompanied by detailed data on staff. Information on teachers and staff, such as educational attainment, experience, and salary, will help agencies better understand issues like the relationship between student achievement and teacher quality, teacher supply and demand, and staff attrition and mobility. (Center for Strengthening the Teaching Profession 2008)

Data warehouse

"An (education) data warehouse is a storage facility, built and maintained by (an agency), where detailed and reliable (education) data from several areas that affect student achievement are stored and integrated." (DQC 2007, *How Can My State Benefit from an Educational Data Warehouse?)* This LDS component should be district- or statewide and should link student, school, and district information over time. (DQC 2006, *Creating Longitudinal Data Systems: Lessons Learned from Leading States)*

Reporting and analysis tools

"Reporting and analysis tools (…) are essentially the software programs written to calculate the statistics that stakeholders need to evaluate the performance of a student, school, district, or state and produce reports (electronic or print) that answer stakeholder questions." (Steiny and Smith 2007) Without these tools to provide stakeholders with easy access to the data in both raw form and in standardized reports, reaping the full benefits of an LDS would be impossible. Many agencies build an LDS without investing in reporting and analysis tools, only to find that use of their new data is limited, seriously compromising the usefulness of the system.

Interoperability

Interoperability is the quick and easy transfer of data between systems via a common set of technical software standards. "Data interoperability entails the ability of different software systems from different vendors to share information without the need for customized programming or data manipulation by the end user. Interoperability reduces reporting burden, redundancy of data collection, and staff time and resources. (…) It depends on systems having common data standards and definitions." (DQC 2006, *Creating Longitudinal Data Systems: Lessons Learned from Leading States)*

Portability

"Data portability is the ability to exchange student transcript information–e.g., course completed, credits earned, GPA, etc.–(and other relevant student records) electronically across districts and between P–12 and postsecondary institutions within a state and across states. Portability has at least three advantages:

- it makes valuable diagnostic information from the academic records of students who move to a new state (or district) available to their teachers in a timely manner;
- it reduces the time and cost of transferring students' high school course transcripts; and
- it increases the ability of agencies to distinguish students who transfer to a school in a new state (or district) from dropouts. The large interstate movement of students in the wake of Hurricane Katrina made the value of such a system obvious. Data portability is supported by the implementation of interoperable systems, but it requires (agencies) that use these systems to have a set of common definitions or protocols." (DQC 2006, *Creating Longitudinal Data Systems: Lessons Learned from Leading States)*

The Forum has more detailed information…

...about managing data in a crisis

- *Crisis Data Management: A Forum Guide to Collecting and Managing Data About Displaced Students (2010)*
  http://nces.ed.gov/forum/pub_2010804.asp

...about education data privacy issues

- *Forum Guide to the Privacy of Student Information: A Resource for Schools (2006)*
  http://nces.ed.gov/forum/pub_2006805.asp
- *Forum Guide to Protecting the Privacy of Student Information: State and Local Education Agencies (2004)*
  http://nces.ed.gov/forum/pub_2004330.asp
- *Privacy Issues in Education Staff Records (2000)*
  http://nces.ed.gov/forum/pub_2000363.asp

Privacy protection

"One of the critical concepts that should underscore the development of any LDS is preserving student (and staff) privacy. An important distinction needs to be made between applying a 'unique student identifier' and making 'personally identifiable information' available, for example. It is possible to share data that are unique to individual students but that do not allow for the identification of that student. It also is critical to put in place encryption and data security protocols to secure the transmission or transaction of data between and among systems. States should ensure that they bring privacy considerations into the development of each repository and the exploration of each protocol or report." (DQC 2006, *Creating a Longitudinal Data System: Using Data to Improve Student Achievement)* Compliance with federal and state privacy laws must be ensured and staff must be trained on the education agency's privacy and security policies to protect sensitive data.

Data sharing beyond K–12 (P–20)

The scope of an LDS is not limited to the K–12 grade levels. Indeed, the value of longitudinal data is even greater when it spans beyond these years into early childhood and postsecondary education, and the workforce. Systems that span these years are commonly referred to as "P–20" systems.*

Early childhood education

For years, many states have been collecting student-level data on publicly funded pre-kindergarten (PK) and early childhood education (ECE) programs for students with special needs. These data typically include information on which services were received and where. However, few states have child-centered data systems that track enrollment or participation in private PK or ECE programs or daycare centers. As policy and education discussions expand to address P–20 longitudinal data systems and the impact of educational opportunities across the full spectrum of learning, more education stakeholders are trying to understand the relationship between early childhood learning and kindergarten- or grade school-readiness, and subsequent performance.

Postsecondary education

"As states and school systems work to align expectations in high school with the demands of postsecondary education, they need better data on (students who) leave the P–12 system and enter college (and other postsecondary programs). Most states today do not have data systems that enable this two-way communication. With the ability to match student records between P–12 and (postsecondary education), policymakers and educators would know:

- the percentage of each district's high school graduates who enrolled in college within 15 months after graduation;
- the percentage of last year's graduates from each high school or school district who needed remediation in college, and how these percentages varied by student income and ethnicity;

*All data sharing should be conducted in compliance with relevant federal and state privacy laws.

- the percentage of students who met the proficiency standard on the state high school test and still needed remediation in the same subject in college; and
- how the students' ability to stay in, and complete, college is related to their high school courses, grades, and test scores." (DQC 2009)

Workforce

With a connection between education and workforce data, researchers can answer questions about whether schools, colleges, and universities are preparing students for long-term success in the workplace, what percentage of students graduating from a district or school is unemployed one year after graduation, and how a graduate's earnings are related to academic preparation in high school. (DQC 2007, *Linking Education and Social Services Data to Improve Child Welfare)*

Data audit system to assess data quality, validity, and reliability

"Invalid or unreliable reporting by some schools and districts is a problem in a number of states, and this problem is likely to continue in the absence of checks on the accuracy and quality of the data submitted by schools and districts. Without a well-designed and well-implemented state data audit system, the public cannot have confidence in the quality of the information coming out of the state's public education system. With a robust data audit system in place, policymakers and educators will know:

- whether or not the disaggregated student information used to rate schools for Adequate Yearly Progress (AYP) is valid;
- the districts that do the best job of reporting valid and reliable dropout data;
- whether or not districts are reporting their numbers of untested students and reasons for not testing the students; and
- the amount and type of data quality problems identified by districts and how those problems are being addressed." (DQC 2009)

These issues also exist within districts. Without controls over local school data quality, district-level LDSs will suffer the same confidence issues as state-level systems.

Expanded Features

To be highly effective, an LDS should ideally include or allow for the following expanded features.

Interim and formative assessment data

In addition to the maintenance of state-mandated, annual summative tests, a state-level LDS may also maintain data on interim and formative assessments. These tests, which will ideally be aligned with the academic standards of the summative assessments, are given throughout the year and provide students and educators more timely and detailed measures of how students are progressing. By equipping educators with more granular data than annual assessments, interim tests allow teachers to use data proactively, identifying problems early on and getting students back on track right away. Educators can use the information to adjust instruction throughout the school year to better meet student needs by, for example, providing additional help in areas where students are struggling or giving advanced students more challenging material. These data are often maintained at the local level, but also may be incorporated into the state LDS.

Linkage to finance data

Collecting consistent and accurate financial data at the individual school-, staff-, and program-levels can be challenging, but success is key to understanding the relationship between expenditures and student achievement. "Creating a comprehensive data system that links longitudinal student outcome data to financial data at the district level–and ultimately, the school or even classroom levels–can help decisionmakers understand not only what works but also what it takes to deliver what works." (Gazerro 2008) More specifically, "a high-quality financial system that is connected to longitudinal student data supports student learning in a number of fundamental ways:

- facilitating the identification of resource-effective strategies and schools;
- providing insight into the most productive ways to structure districts, schools, and classrooms to support student outcomes; and
- increasing transparency for education stakeholders at all levels to ensure that increasingly scarce resources are spent in the most efficient and effective way." (Gazerro 2008)

Linkage to facilities data

Data on school facilities offer insight into the physical environment in which students receive their education. Facilities data describe the condition, design, utilization, management, and funding of school facilities. Facilities data elements may include a wide variety of information such as building identifiers and addresses,

date of original construction, renovation and new construction details, site acreage, building area (for example, square footage), building and site condition, safety appraisal information, air conditioning and heating systems, operations management particulars, building use, and so forth. Collecting these data and linking them to other education information can help decisionmakers ascertain the adequacy of these facilities; determine where they are located; and inform decisions about funding, renovation, modernization, and infrastructure improvements. (The Forum 2003, *Facilities Information Management: A Guide for State and Local Education Agencies)* These data should be shared with the state to inform state- and national-level policy planning and implementation.

Data sharing with Social Services

By linking education and Social Services data, education agencies can analyze

- the impact of school mobility on student achievement for children and youth in foster care, including how it affects success in higher education and the workforce;
- how services beyond the scope of the classroom (for example, health care, child welfare, postsecondary education access, public safety) can be better tailored to help each student meet academic goals;
- how initiatives can be better aligned and coordinated among the education, child welfare, and judicial systems to increase success and reduce service duplication; and
- what practices and programs have demonstrated the ability to improve outcomes for students, including not only educational achievement, but also social, health, and civic progress. (DQC 2007, *Linking Education and Social Services Data to Improve Child Welfare)*

While this data sharing is more likely to occur at the state level, some large urban districts where social service programs are offered may also benefit from links with local social services departments.*

Role-based stakeholder access via web-based portals

Depending on the needs and authorization of various users, role-based access to LDS data can be established to protect sensitive information from getting into unauthorized hands while allowing users to easily access the system for legitimate educational purposes. State education agencies, school districts, and vendors are increasingly turning to web-based portals as a means of presenting data. In addition to eliminating the need to prepare and send data files and reports to multiple users, these portals provide an excellent mechanism for controlling security and access to sensitive information. For example, with a username and password, teachers can be granted access to personally identifiable data on their current students, but only to aggregated data for other classes in the school. Similarly, parents could retrieve

*All data sharing should be conducted in compliance with relevant federal and state privacy laws.

data on their children while being prevented from viewing information about other students. Other stakeholders such as students, administrators, researchers, and the public could also be granted role-based access to the data.

Other data

In addition to data usually collected on students and staff, other information can be valuable in informing decisionmaking. For example, data about student, parent, and staff perceptions and experiences can provide insight into what changes could be made to improve the educational environment. For instance, how do students perceive their relationships with teachers and the expectations teachers have for them? Do parents feel their children's teachers are committed to student success? Do parents have enough time to help their kids with homework after school? Do teachers feel the school has a vision? Are they given ample support? (Bernhardt, 2004)

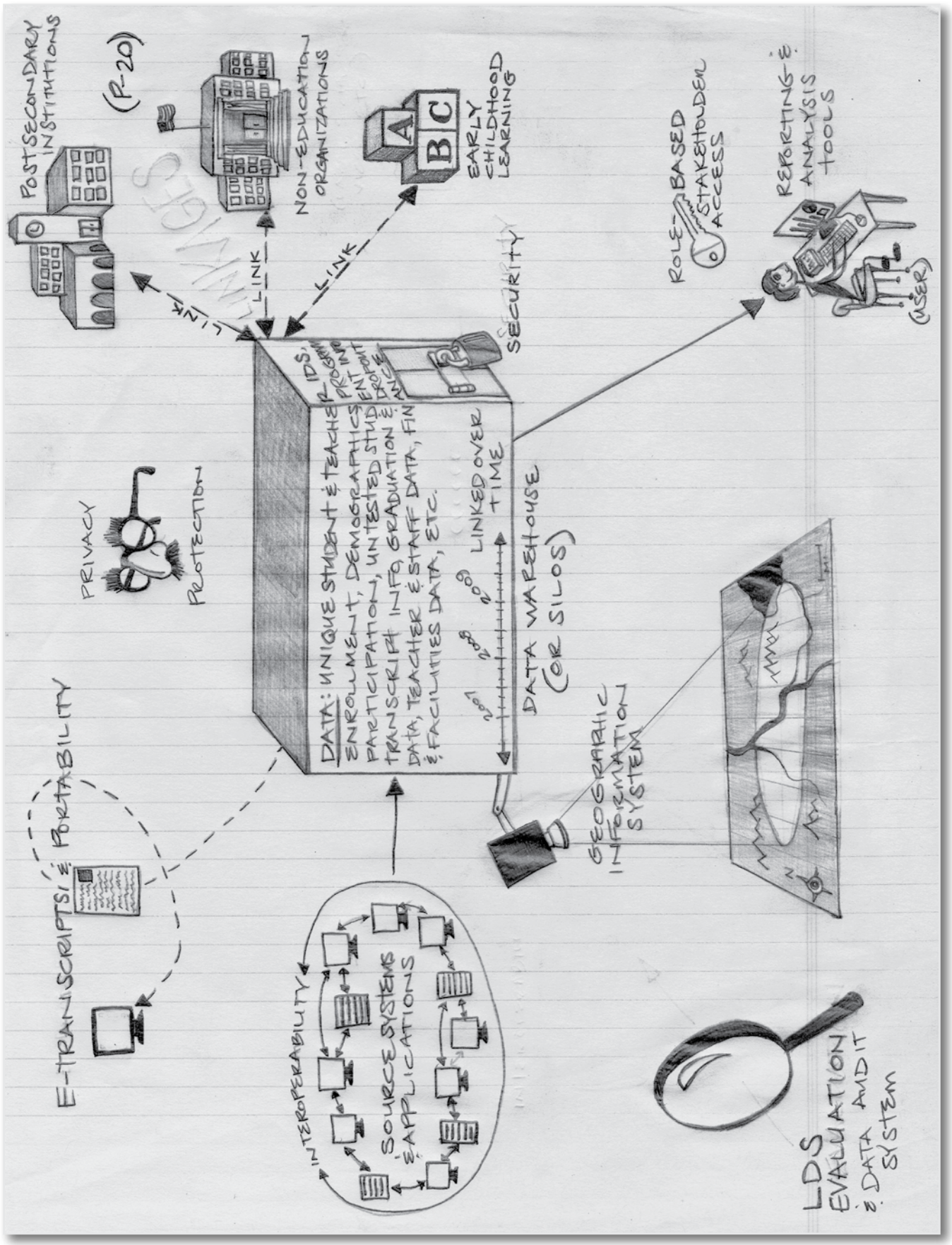
Additionally, data on school processes, such as those that describe school programs, curricula, and instructional and assessment strategies can provide another revealing window into the classroom. (Bernhardt, 2004) Furthermore, community demographics such as household income levels, unemployment rates, and adult education levels can also be informative. (Newby 2007) All of this additional information can add dimension to analyses, helping education data users explore more of the factors involved in student learning and success.

Geographic information systems

According to the U.S. Census Bureau, a geographic information system (GIS) is "a computer system for the input, storage, processing, applications development, retrieval, and maintenance of information about the points, lines, and areas that represent the streets and roads, rivers, railroads, geographic entities, and other features on the surface of the Earth–information that previously was available only on paper maps." As an education LDS tool, a GIS offers unique functionalities such as providing landscape views of student population characteristics and growth, achievement data, and graduation rates. Policymakers, researchers, and parents are often especially interested in this type of information.

The following page offers a rough sketch of a longitudinal data system.

Rough sketch of a longitudinal data system



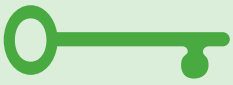
Chapter 4

Dispelling the Misconceptions: What an LDS Is, and What It Is Not

There are many ideas about what constitutes a longitudinal data system (LDS) and how one is used. What is its purpose? What is its value? What components and capabilities should it have–a data warehouse, reporting and analysis tools, linkages to P–20, interoperability? While there is plenty of room for differing opinions on these questions, some commonly held beliefs about LDSs are simply wrong, and these misconceptions should be addressed. You may have heard some of these LDS misconceptions at a conference or around the office.

"Yeah, sure we have an LDS. We just rolled out our data warehouse."

A data warehouse is not necessarily an LDS



DW ≠ LDS

While a data warehouse can be an extremely valuable LDS component, it is possible to build an LDS that draws data from numerous interoperable silos or separate data stores. What matters is not the type of system used to store the data, but the type of data it collects, stores, and makes available. For example, a data warehouse is not an LDS if it contains only aggregated and/or snapshot data. To be an LDS, a data warehouse must contain comprehensive, student-level longitudinal data that span many years.

Other types of data systems may be confused with an LDS. An operational data store (ODS), which is very similar in structure to a data warehouse, maintains only transitional information from multiple sources. The system is updated frequently to reflect the current status of an object (for example, a student's enrollment), rather than historical data. In effect, users are only able to make queries on recent data. (Inmon 1999) Similarly, a transactional database (a transactional data management system), which is designed for recording and processing data from only a single source, should also be distinguished

from an LDS. While transactional systems manage the daily "transactions" of the school (attendance and disciplinary records, financial transactions, library circulation, etc.), their data change frequently and are not typically stored for the long term. Rather, transactional data are typically transformed for permanent storage in a data warehouse and accessed by the LDS for long-term tracking. Even when they are stored, these data are not suitable for trend reporting and analysis. In sum, while very useful for daily school operations, neither of these types of systems can substitute for the functionalities of an LDS.

"Call the IT department and tell them to build us an LDS."

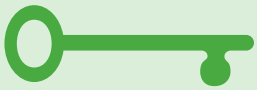
An LDS is not just an information technology (IT) project

An LDS is not just an IT project.

An LDS is a business solution, a way to meet information needs. IT staff can build an LDS, but the system they develop may not meet user needs. Education experts and other data users must work closely with IT throughout the design and development process to ensure the system will effectively serve their requirements. Developers must consider how users do their jobs and what functionalities will make this work easier and more efficient. They should also think about how end users will access and use the data and how the new system can help them maximize the information's utility.

"We'll just buy an LDS and be done with it."

An ideal LDS may not be available out-of-the-box



Know what you need before going shopping.

An education agency should not expect an "out-of-the-box" LDS or LDS component to be a success without extensive agency involvement for a number of reasons.

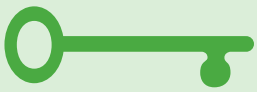
- A successful LDS needs to take into account and meet stakeholder needs, which vary among regions and organizations. Agency staff should carefully plan the system, learn about possible solutions, and figure out how best to meet their stakeholders' needs and benefit their students. If these stages are skipped, there is little way to know if the purchased product is what is actually needed today or in the future. Being an informed consumer is essential to getting a successful system.
- An LDS is not a one-time effort. In addition to initial development costs, ongoing maintenance and updating are required to ensure long-term value.

- Beyond the technology, an LDS requires an organization to shift its ideas about data, valuing information as a tool rather than seeing it as a burden. Ongoing planning, communication, and professional development for users are necessary to make this happen.

"This LDS thing makes me uncomfortable. It's just going to be used as Big Brother."

An LDS is not a punitive tool

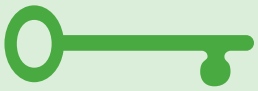
LDSs are sometimes viewed skeptically, as tools to monitor and punish staff members. For instance, some fear that student test score data linked to teachers will be used to determine bonuses or target individuals for termination or transfer. However, the reality is much more complicated. At both the district and state levels, data have been used to reward effective teachers, identify struggling ones to target professional development, and identify and remove ineffectual educators. These data are also being used to evaluate teacher preparation programs, identify effective ones to improve pre-service training curricula, and to hold chronically ineffective preparation programs accountable. The main value of an LDS, however, is its ability to help determine what works, identify ways to improve instruction, tailor approaches for individual students, recognize problems early on to prevent academic failure and dropouts, and automate and streamline daily administrative operations. Most education leaders agree that these systems should be used to empower staff by giving them access to valuable information, not to punish. In fact, some states have gone as far as to pass laws prohibiting punitive uses of the data.



LDSs should be designed and used to empower educators, not just to hold them accountable.

State, district, and school leaders must build trust through clear communication and collaboration within the education community to assuage fears about LDS misuse. While student data can be very useful in teacher evaluations, they should be only a component of the process and a wide range of indicators should be used. By providing a more complete and detailed view of student learning and educational inputs, longitudinal data can, in fact, make the evaluation of educators and schools a fairer process, one that is more likely to be embraced by all parties than snapshot data points and other imprecise measures.

"When we get our LDS, we can kiss all our problems goodbye! The kids are gonna do great!"



An LDS alone does not improve education.

Simply having an LDS will do nothing to benefit students

Just as a new, high-tech cell phone will not make a busy life any more manageable if used like an old rotary, a new LDS will not serve an organization any better than the legacy system if it is not put to good use. A sophisticated LDS can be a tremendous tool for shedding light on the nuts and bolts of education, and for improving student outcomes. However, agencies must be aggressive and creative in using their LDS to take advantage of its full potential.

Chapter 5

LDS Benefits: Why Should We Build These Systems?

A longitudinal data system (LDS) is not just a compliance system that will feed the state and federal governments more data. An LDS has the potential to make high quality, timely data available to all stakeholders to help them improve student achievement, ease data burdens, and leverage significant educational change. This chapter gives an overview of the types of benefits such a system can offer.

Better Data
+ Deeper Questions
+ More Informative Answers
= Enhanced Education

Enhanced Education

An LDS can bring reality into clearer focus. When we "zoom in" on aggregate-level data, we see student-level data. When staring at a static image on the screen, longitudinal data are what we can observe when we press "Play" and follow the data (and in effect, students) through time and space. Therefore, longitudinal student-level data show the "real time" details of what is going on in an education organization. With these data, policymakers and educators no longer need to act on "hunches" or remain in the dark about what effects their decisions and practices have on students. LDS data provide transparency and allow far greater examination into the effects certain policies, programs, schools, principals, teachers, and classroom practices have on individual students.

Beyond simply monitoring student outcomes and reacting to traditional aggregate data, policymakers and educators can use LDS data to be more proactive. By illuminating the influence of the many variables that may contribute to student success or failure, longitudinal student-level data can help agencies identify trends; predict outcomes; and make more informed decisions about policy, administration, and instructional strategies. Education leaders will then be better equipped to create better policies, use resources more efficiently, and pursue the most effective teaching strategies to meet individual student needs. By providing timely information about what works where, and for whom, an LDS allows educators to shift to more proactive uses of data. That is, they can take us from asking, "What went wrong?" to identifying potential problems early on and asking, "What can we do to promote student success and avoid failure before it occurs?" For example, by making student-level longitudinal data accessible at the classroom level, teachers can easily view details of their students' histories (information that may or may not be available in

Answering deeper questions requires more precise detail. And having more detail requires better systems for organizing and accessing the information.

traditional cumulative folders, but is consolidated electronically and readily accessible in a timely fashion through the LDS), follow progress throughout the school year, identify weaknesses, and tailor instruction to address problems before it is too late. They can work with other teachers to identify and learn from effective strategies. And with better data, they can more easily explore whether there are early warning signs for undesirable outcomes like dropping out, and act to keep students on track and in school.

Detailed student-level longitudinal data allow agencies to more accurately answer traditional questions such as, how many students are there in a school district? What percentage of fourth grade African-American students met the state's proficiency standard in math last year? What is the school's graduation rate? More importantly, by showing the educational system in finer detail, these data allow answers to deeper questions than was possible with aggregate-level, cross-sectional, "snapshot," data. For example, with LDS data the often inaccurate graduation rate estimates of the past can be replaced with more precise counts based on student-level data. Moreover, longitudinal data can be used to see how many years it took those graduates to earn their diplomas; and find out what they did after graduation day, in postsecondary education and in the workforce.

Table 2 presents some other examples of the types of questions LDS data can answer.*

Table 2. Types of questions detailed student-level, longitudinal data can answer

Questions about Individual students
■ What early childhood education program did a kindergartner attend, if any? At what age did the child enter the program? How did he fare in elementary school?
■ How has a student progressed in math over the course of the year? How did she perform in this subject in earlier grades? Was there a time when her performance took a turn for the worse?
■ In what specific areas of the reading curriculum does a student need extra help?
■ Did a student drop out or transfer to another school? If she dropped out, did she ever participate in a dropout intervention program?
■ Which students in a school are at risk of dropping out in the future? What intervention program will be most effective in preventing this outcome?
■ What courses did a student take in high school and how did they prepare him for college? Did he require remediation? Did he earn a degree and, if so, how many years did it take?

* Answering many of these questions requires a very sophisticated LDS that collects certain detailed data (e.g., unique student and teacher identifiers) and in depth data on students, teachers, classroom practices, school resources and facilities, and expenditures. The LDS must also be capable of linking these data to one another, from year to year; students to their teachers; and K–12 to prekindergarten, postsecondary, and the workforce.

Questions about groups of students

- How are the Hispanic students in a school district doing academically this year compared with the White students? Tracking the same students back in time and to other institutions, how did they do the prior year? How do the schools they attend compare in terms of various characteristics such as funding and teacher quality?
- How did students who attended a certain middle school fare in high school?
- How many African-American students who were proficient on the 8th grade mathematics exam were also proficient on the 10th grade mathematics exam? Of those students, how many took algebra I in the 8th grade?
- How do students identified as "limited-English proficient" perform in comparison with students whose native language is English?

Questions about teachers

- How do various teacher qualifications or training (e.g., education level, degree, certification, undergraduate institution, professional development, and teacher test performance) correlate with student performance? Do these effects vary among certain types of students?
- Which teachers are most successful in improving the skills of struggling students?
- Which teachers' students achieve the greatest improvements in a particular subject? What are these teachers doing differently?
- How are teachers of varying qualifications distributed among schools and students?
- What are the teacher retention rates among various institutions?

Questions about policies, programs, strategies

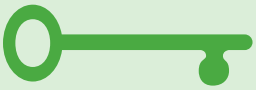
- What is the impact of certain teacher policies on teacher recruitment and retention? In addition, what impact do these policies have on student outcomes?*
- What impact does a policy have on student achievement? Do these effects vary among students with different characteristics?
- Was a program successful in boosting achievement? Did certain types of students benefit from it more than others? What value did it add to student performance?
- Did a teaching strategy succeed? How did students taught with this strategy compare with similar students who were taught using another approach?
- What effect does using certain materials or technologies have on student outcomes? Do some teachers have greater success with certain tools?
- How do varying funding levels or resource allocation strategies relate to student success or program effectiveness?

*National Center for Analysis of Longitudinal Data in Education Research (adapted from stated research focus).

Questions about indicators	■ What are the early indicators of high dropout risk? ■ Is a certain local assessment a good predictor of success in a subsequent grade? ■ Is a specific state assessment a good predictor of success in postsecondary education? ■ What levels of middle school achievement are associated with success in high school? ■ What high school performance indicators are the best predictors of student success in the workplace? (DQC 2007c)
Questions about schools	■ Controlling for different student populations and other characteristics, which schools produce the most academic growth in their students? ■ How does the success of students enrolled in a specific school for a certain period of time compare with that of students enrolled for the same amount of time in the highest-performing comparable schools? ■ How does a middle school perform with students who entered the school well prepared in mathematics? How does the same school perform with students who were poorly prepared? (Dougherty, 2002) ■ What percentage of a school's graduates requires remediation in college? ■ How is a school's increase in proficiency rates related to the attrition of its low-performing students? (Anderson, Fowler, and Klein 2005)
Questions about districts	■ What are the characteristics shared by the highest performing districts? How does the quality of these districts' teaching staff compare with that of other districts in the state? ■ What is a district's National Governors Association (NGA) graduation rate? ■ How do districts compare in the number of students who enroll in postsecondary institutions? In the percentage that requires remediation? Who earns a degree? ■ Which districts have the highest teacher turnover rates? ■ How many students does a district actually serve?
Questions about states	■ What is a state's NGA graduation rate? ■ What percentage of a state's high school graduates required remediation in college? ■ Where do graduates of a teacher preparation program get hired to teach? How long do they remain in their first jobs? Do graduates of certain programs have greater success with students than others?

Streamlined Operations and Eased Data Burden

An LDS can be designed to make everyday operations more efficient, thereby freeing staff to spend more time focusing on students and less on data entry. Interoperability and data sharing among a school's various data systems, for instance, eliminate the need for redundant data entry and, at the same time, limit entry errors. Consolidating data into a unified system can also eliminate redundancy. In addition, aligning data definitions among schools and districts will result in more consistency and improve data quality. And automating mandated state and federal reports will also reduce data burden and free up resources and staff time for more student-centered work and analysis.



Small gestures, big impact

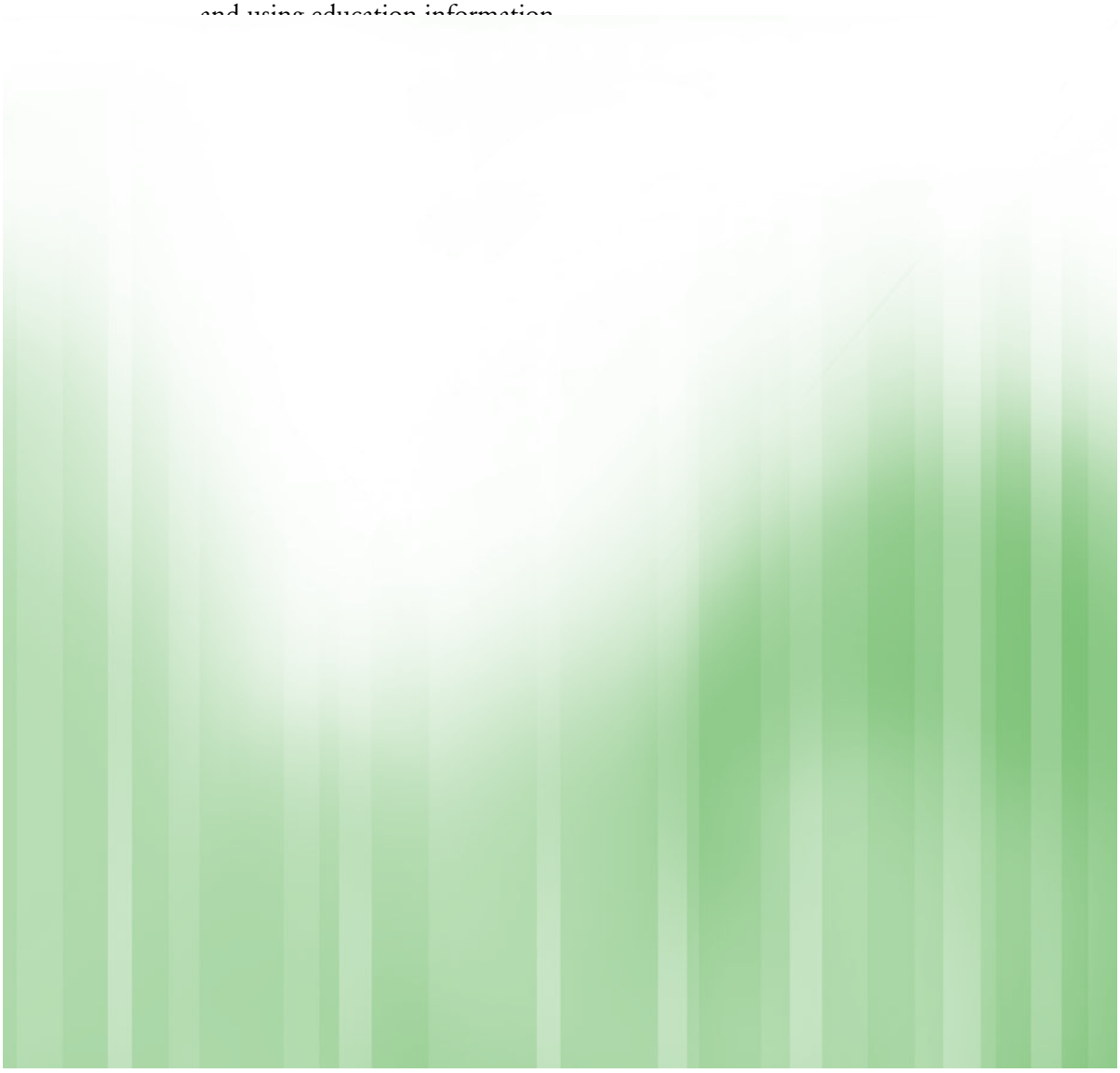
The simplest of tools may turn out to be the most appreciated. One state education agency learned this lesson when it used its LDS to quickly and easily produce student lists by school. These simple lists were very popular in the state, as they showed schools which students they were responsible for each year and helped decrease the burden on local staff. While agencies may spend a lot of time and money developing electronic data access and analysis tools, the value of basic lists and reports should not be underestimated.

Staff should know that an LDS is not just another system into which they will load data for the state and federal government. In fact, the primary purpose of an LDS should be to help improve school- and district-level operations, and classroom-level instruction. An LDS can facilitate a quick and easy exchange of data–from the local users to the state, to the federal government, and back. Today, many local agencies provide the state and federal government with required data. Often, these agencies never see these data again. If they do, in the form of, for example, a report comparing districts in the state, a year or more might have passed. With an LDS, these data may quickly be made available to the local users in a number of formats, from sophisticated reporting and analysis tools, to standardized reports, to basic lists. The simplest tools are often the most appreciated.

Culture Change

LDSs have the potential to change our relationship with data, revolutionizing the way the education community thinks about, and uses, information. By improving data quality and increasing the speed at which agencies return data to districts and schools for use in decisionmaking and instructional improvement, an LDS can open the door to many new possibilities for managing learning. At the local level, these systems, when accompanied with the requisite training, can transform technology wary teachers into empowered data consumers who use data to gain valuable insight into their students' needs and help tailor instruction to better meet those needs. Principals, district administrators, state

policymakers, and other decisionmakers can use detailed, longitudinal data to determine which programs and policies work (and which do not), identify systemic problems, and allocate resources more efficiently. LDSs can turn staff who spend their days entering data into users who have time to turn the information into action for their schools and students. And, because an LDS can make data useful and accessible to the local education community, shifting data from a compliance burden to a universal resource, staff will have more reason to ensure the information is of high quality. Education researchers can expand their toolkit from trying to draw conclusions from cross-sectional, aggregate data to using individual-level, longitudinal data to get more valid and reliable results. In all of these ways, we see that LDSs not only require, but also inspire, new approaches to considering and using education information.



Appendix A
Overview of the LDS Guide Series

The *Traveling Through Time: The Forum Guide to Longitudinal Data Systems* series consists of four guides intended to help state and local education agencies meet the many challenges involved in developing a robust longitudinal data system (LDS), populating them with quality data, and using this new information to improve the education system.

Book One of Four: What is an LDS?, focuses on the fundamental questions of what an LDS is (and what it is not), what steps should be taken to achieve a sound and successful system, what components make up an ideal system, and why such a system is of value to education. *Book Two of Four: Planning and Developing an LDS*, will discuss the critical planning and development phases of an LDS project, from stakeholder engagement and needs assessment all the way through to system evaluation. *Book Three of Four: Effectively Managing LDS Data* will explore several fundamental challenges of data management, focusing on data governance, data quality, privacy, and security. Finally, *Book Four of Four: Advanced LDS Usage*, will address the effective utilization of LDS data, discussing the users and uses of the data; and emphasize the need for effective training and professional development. The figure below lays out the major issues covered in each of the four books in this Forum guide series.

Book I: What Is an LDS?

- Understanding what an LDS is (and is not)
- Appreciating the organizational steps needed to institute and effectively use an LDS
- Identifying the technical features and capabilities of an effective LDS and the additional features that can enhance the system's utility
- Recognizing the benefits of an LDS

Book II: Planning and Developing an LDS

- Engaging stakeholders
- Describing the current system
- Envisioning the desired system
- Defining needs, including data and functionality
- Gaining buy-in and funding
- Building relationships
- Writing an RFP
- Building or buying a system or components
- Transferring knowledge (e.g., from developers to staff)
- Defining and measuring success
- Refining the system

Book III: Effectively Managing LDS Data

- Defining governance structure
- Defining roles and responsibilities
- Collaborating to improve data quality and streamline operations
- Managing changes to the system
- Training staff to ensure data quality
- Auditing/validating data at all levels
- Establishing/following data standards
- Securing data to protect privacy
- Providing users access to key data

Book IV: Advanced LDS Usage

- Collecting, storing, and delivering key data
- Developing useful reports to fulfill common data requests and needs
- Developing user-friendly data tools to facilitate access and analysis
- Training users to utilize the technology
- Building awareness, understanding, and analytical capacity

Appendix B
References

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Appendix C
Additional Resources

A Policymaker's Guide to the Value of Longitudinal Student Data

Dougherty, C. (2002). Education Commission of the States.

http://www.ecs.org/clearinghouse/40/21/4021.htm

This brief provides a quick summary of the uses and value of longitudinal data. It also lists some questions that only longitudinal data can help us answer.

Measuring What Matters: Creating a Longitudinal Data System to Improve Student Achievement

Data Quality Campaign (DQC 2007).

http://www.dataqualitycampaign.org/files/publications-measuring_what_matters.pdf

This brochure reviews state progress toward building longitudinal data systems (LDS), and discusses the benefits and possibilities of these systems. It includes the direction of state data systems (e.g., finance data linked to students and programs, links to social services and employment data, and interstate transfer of data through use of common standards), the rationale for building LDSs and the benefits they provide, and a review of national progress toward each of the Data Quality Campaign's (DQC) "Ten Essential Elements."

Judging Student Achievement: Why Getting the Right Data Matters

MPR Inc. and National Center for Educational Achievement (NCEA 2005).

http://www.dataqualitycampaign.org/files/tools-judging_student_achievement.pdf

This policy brief reviews some of the benefits of longitudinal data over the cross-sectional data used to-date in education. These include the ability to assess student academic growth and proficiency over time; monitor student mobility, retention, and attrition; examine prior achievement for all student subgroups; and predict future student achievement.

Every Student Counted: Using Longitudinal Data Systems To Calculate the National Governors Association's High School Graduation Rate and Improve Student Success

Data Quality Campaign (DQC 2007).

http://www.dataqualitycampaign.org/files/publications-every_student_counted-073107.pdf

To calculate the National Governors Association's (NGA) graduation rate, states need to have an LDS that provides the ability to track individual students from year to year, and across campuses and districts. This article outlines the benefits and need for LDSs in this area.

Tapping into the Power of Longitudinal Data: A Guide for School Leaders

Data Quality Campaign (DQC 2008). *http://www.dataqualitycampaign.org/files/publications-tapping_into_the_power_of_longitudinal_data-a_guide_for_school_leaders-010108.pdf*

This article explores the advantages that longitudinal data afford teachers and principals, in contrast to snapshot data. It presents "six key uses of longitudinal data": progress monitoring, diagnosis and prescription, internal benchmarking, external benchmarking, predictive analysis, and evaluation.

Getting the Evidence for Evidence-Based Initiatives: How the Midwest States Use Data Systems to Improve Education Processes and Outcomes

Issues and Answers Report (REL 2007–No. 016). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest.

http://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=29&productID=15

This report reviews the progress of several midwestern states in developing LDSs and using data systems in general. Based on interviews with state education agency (SEA) officials and federal agency staff, the authors review the work that has been done, the challenges that have been faced, and the current requirements being pursued by the states.

Data Use Drives School and District Improvement

Quarterly Issue Brief (Sept. 2006). Data Quality Campaign (DQC).
http://www.dataqualitycampaign.org/files/meetings-dqc_quarterly_issue_brief_092506.pdf

Although data can be used by school systems in myriad ways to promote systemwide success, this DQC brief focuses specifically on how stakeholders at all levels can support access to, and use of, a student's academic history to adjust instruction and meet the student's needs.

Redefining Student Data Access Policy

Hill, E. Legislative Analyst's Office (LEA 2008)

http://www.lao.ca.gov/2008/edu/student_data_access/student_data_access.pdf

See pages 5–7 of this document for a brief discussion of the uses and benefits of an LDS.

Questionnaire for Teacher Specialists

South Carolina Department of Education (2007)

Available via LDS Share at *http://nces.ed.gov/programs/slds/ldsshare/slds.aspx*

This questionnaire was used to determine the value (to teachers) of specific data elements for the state's data warehouse.

Harnessing the Potential for Research of Existing Student Records Databases: An Action Agenda

National Center for Higher Education Management Systems (NCHEMS 2005).
http://www.dataqualitycampaign.org/files/tools-harnessing_the_potential_for_research_of_existing_student_records_databases-an_action_agenda.pdf

This document is the result of a 2005 meeting of academic researchers and individuals responsible for several state student unit record systems (SUR). It explores the potential benefits of SURs and some issues associated with their development and use.

Building and Using Statewide Longitudinal Data Systems: Implications for Policy

Data Quality Campaign (DQC 2007).

http://www.dataqualitycampaign.org/files/publication-building_&_using_statewide_longitudinal_data_systems-implications_for_policy-040107.pdf

This is a brief summary of potential benefits of an LDS, as well as the requirements of a good one. It summarizes state progress and reasons for the recent rapid increase of LDSs. A discussion of the barriers for the development and use of LDSs is included.

Longitudinal Student Data in the No Child Left Behind Act of 2001

Dougherty, C. National Center for Educational Accountability (NCEA)

http://www.dataqualitycampaign.org/files/publications-longitudinal_student_data_in_the_no_child_left_behind_act_of_2001.pdf

This article outlines the ways an LDS can help education agencies achieve the goals of the No Child Left Behind Act of 2001 (NCLB). It also outlines scenarios under which an LDS might be funded by the federal government. (While not required by the law, LDSs are encouraged in some passages.)

Creating a Longitudinal Data System: Using Data to Improve Student Achievement

Data Quality Campaign (DQC 2006)

http://www.eric.ed.gov/ericwebportal/custom/portlets/recorddetails/detailmini.jsp?_nfpb=true&_&ericextsearch_searchvalue_0=ed500439&ericextsearch_searchtype_0=no&accno=ed500439

See this document's appendix for state education agency action steps towards implementing the DQC's "10 essential elements."

The Case for a Longitudinal Student Data System in California

Spinetta, A. and Sankaran, I. (2002) *EJournal of Education Policy, EDLP 225.* California State University, Sacramento.

https://www4.nau.edu/cee/jep/journals.aspx?id=94

This brief policy paper argues the case for developing an LDS, citing a host of benefits from student tracking to policy analysis. It considers several states' systems, security, and student identifiers.

Other Resources

National Center for Analysis of Longitudinal Data in Education Research (CALDER)

http://www.caldercenter.org

The National Center for Analysis of Longitudinal Data in Education Research (CALDER) is a research program of the Urban Institute and several universities. Visit for some examples of research made possible by the availability of longitudinal student data. The main focus of CALDER is to examine "how state and local policies, especially teacher

policies, governance policies, and accountability policies affect teachers (e.g., who teaches what students) and students (e.g., academic achievement and attainment)." In addition to housing a large collection of publications, the site also provides links to several longitudinal state databases.

IES Statewide Longitudinal Data Systems Grant Programs

http://nces.ed.gov/programs/slds/stateinfo.asp

This site contains downloadable abstracts of the work grantee states of the IES Statewide Longitudinal Data Systems (SLDS) Grant Program are completing with the help of their grant, along with each state's original grant application.

Council of Chief State School Officers (CCSSO) Longitudinal Student Data Systems Task Force

http://www.ccsso.org/projects/education_information_management_advisory_consortium/longitudinal_student_data_system_task_force

This web page contains notes from the task force's meetings since May 2006. Each meeting includes updates on state LDSs and on the activities of relevant organizations, as well as discussions on topics such as privacy, portability, interoperability, e-transcripts, and P–20 data sharing and integration.

In the News…

Finding Your Way in a Data-Driven World

Davis, M. (2008) *Digital Direction 01 (03).* Education Week.

http://www.edweek.org/dd/articles/2008/01/23/3data.h01.html?print=1

This article provides a glimpse of how some districts are using their LDSs and sophisticated analysis tools to help students. It also offers some important lessons learned from leaders in LDS development.

New Number-Crunching Links Teachers to Test Scores

Alpert, E. (2008). Voice of San Diego. Posted in Education, Sept. 06.

http://www.voiceofsandiego.org/education/article_b4974861-c8c3-5858-a5d8-4c81b09ac0f8.html

This article reports on breakthroughs made possible with longitudinal, student-level data. Interviews highlight the benefits of these data, including saving staff significant amounts of work and making data available promptly to inform decisionmaking. The piece also discusses some of the controversies that surround the use of these data, including fears about merit pay and job security. Concerns are also voiced about the value of standardized tests and their accuracy in assessing student and teacher performance.

Appendix D
Handout: Anatomy of an LDS

Key Nontechnical Steps to a Successful LDS

☐ Establish data governance early on to ensure data quality and utility.
☐ Engage a broad range of stakeholders to build interest and ensure the LDS will meet users' needs.
☐ Identify data "champions" who will build support, locate funding, and develop a culture of data use.
☐ Conduct self- and needs-assessments to clarify where you are and where you want the LDS to take your agency.
☐ Provide training on data tools and professional development on data interpretation and application.
☐ Use the data to improve education with a clearer view of educational operations and student needs.

Technical Components of an LDS

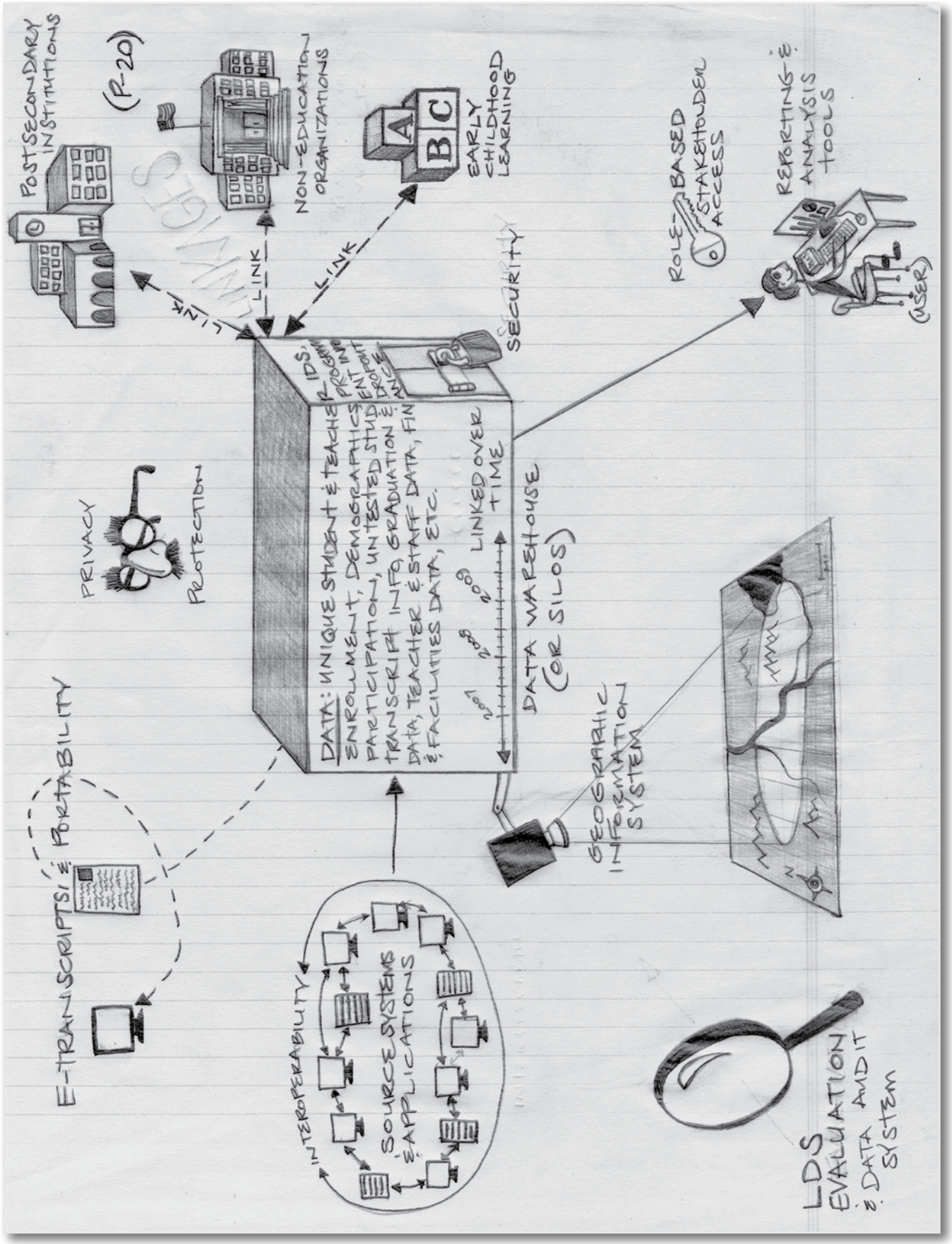
Basic

☐ Student unique identifier system
☐ Student data (enrollment, attendance, demographics, and program participation)
    □ Student-level college readiness test scores
    □ Information on untested students
    □ Student-level transcript and detailed course-taking information
    □ Student-level graduation and dropout data
☐ Annual summative assessment data links from year to year
☐ Teacher unique identifier system and ability to link teacher and student data
☐ Teacher and staff data
☐ Data warehouse
☐ Reporting and analysis tools
☐ Interoperability
☐ Portability
☐ Privacy protection
☐ Data sharing beyond K–12 ("P–20")
    □ Early childhood education
    □ Postsecondary education
    □ Workforce
☐ Data audit system to assess data quality, validity, and reliability

Expanded

☐ Interim and formative assessment data
☐ Linkage to finance data
☐ Linkage to facilities data
☐ Data sharing with Social Services
☐ Role-based stakeholder access via web-based portals
☐ Other data
☐ Geographic information system

Rough sketch of a longitudinal data system



Appendix E
LDS in Legislation

This appendix contains excerpts of key longitudinal data-related language from these major pieces of legislation:

- **The No Child Left Behind Act of 2001**
- **Educational Technical Assistance Act of 2002**
- **The America Competes Act of 2007**
- **The American Recovery and Reinvestment Act of 2009**

The No Child left Behind Act of 2001

http://www.gpo.gov/fdsys/pkg/PLAW-107publ110/pdf/PLAW-107publ110.pdf

Public Law 107–110
107th Congress

An Act

To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Section 1. Short Title.

This title may be cited as the "No Child Left Behind Act of 2001." (...)

Title I. Improving the Academic Achievement of the Disadvantaged. (...)

Part A. Improving Basic Programs Operated by Local Educational Agencies (...)

Subpart 1. Basic Program Requirements (...)

Section 1111. State Plans. (...)

(b) Academic standards, academic assessments, and accountability. (...)

(3) Academic assessments. (...)

(B) Use of assessments.

Each state educational agency may incorporate the data from the assessments under this paragraph into a state-developed longitudinal data system that links student test scores, length of enrollment, and graduation records over time.

Educational Technical Assistance Act of 2002

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_cong_public_laws&docid=f:publ279.107.pdf

Public Law 107–279

107th Congress

An Act

To provide for improvement of federal education research, statistics, evaluation, information, and dissemination; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Title II–Educational Technical Assistance. (...)

Section 208. Grant Program for Statewide, Longitudinal Data Systems.

(a) Grants authorized. The Secretary is authorized to award grants, on a competitive basis, to state educational agencies to enable such agencies to design, develop, and implement statewide, longitudinal data systems to efficiently and accurately manage, analyze, disaggregate, and use individual student data, consistent with the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.).

(b) Applications. Each state educational agency desiring a grant under this section shall submit an application to the Secretary at such time, in such manner, and accompanied by such information as the Secretary may reasonably require.

(c) Awarding of grants. In awarding grants under this section, the Secretary shall use a peer review process that

(1) ensures technical quality (including validity and reliability), promotes linkages across states, and protects student privacy consistent with section 183;

(2) promotes the generation and accurate and timely use of data that is needed

(A) for states and local educational agencies to comply with the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.) and other reporting requirements and close achievement gaps; and

(B) to facilitate research to improve student academic achievement and close achievement gaps; and

(3) gives priority to applications that meet the voluntary standards and guidelines described in section 153(a)(5).

(d) Supplement not supplant. Funds made available under this section shall be used to supplement, and not supplant, other state or local funds used for developing state data systems.

(e) Report. Not later than 1 year after the date of enactment of the Educational Technical Assistance Act of 2002, and again 3 years after such date of enactment, the Secretary, in consultation with the National Academies Committee on National Statistics, shall make publicly available a report on the implementation and effectiveness of federal, state, and local efforts related to the goals of this section, including

(1) identifying and analyzing state practices regarding the development and use of statewide, longitudinal data systems;

(2) evaluating the ability of such systems to manage individual student data consistent with the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.), promote linkages across states, and protect student privacy consistent with section 183; and

(3) identifying best practices and areas for improvement.

America COMPETES Act of 2007

http://www.nist.gov/director/ocla/public_laws/pl110-69.pdf

Public Law 110–69

110th Congress

An Act

To invest in innovation through research and development, and to improve the competitiveness of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Section 1. Short Title.

This Act may be cited as the "America COMPETES Act" or the "America Creating Opportunities to meaningfully Promote Excellence in Technology, Education, and Science Act." (...)

Title VI. Education. (...)

Subtitle D. Alignment of Education Programs.

Section 6401. Alignment of Secondary School Graduation Requirements With the Demands of 21st Century Postsecondary Endeavors and Support for P–16 Education Data Systems. (...)

(e) Authorized activities.

(2) Grants for statewide P–16 education data systems.

(A) **Establishment of system.** Each state that receives a grant under subsection (c)(2) shall establish a statewide P–16 education longitudinal data system that

(i) provides each student, upon enrollment in a public elementary school or secondary school in the State, with a unique identifier, such as a bar code, that

(I) does not permit a student to be individually identified by users of the system; and

(II) is retained throughout the student's enrollment in P–16 education in the State; and

(ii) meets the requirements of subparagraphs (B) through (E). (...)

(D) **Required elements of a statewide P–16 education data system.** The State shall ensure that the statewide P–16 education data system includes the following elements:

(i) **Preschool through grade 12 education and postsecondary education.** With respect to preschool through grade 12 education and postsecondary education:

(I) a unique statewide student identifier that does not permit a student to be individually identified by users of the system;

(II) student-level enrollment, demographic, and program participation information;

(III) student-level information about the points at which students exit, transfer in, transfer out, drop out, or complete P–16 education programs;

(IV) the capacity to communicate with higher education data systems; and

(V) a state data audit system assessing data quality, validity, and reliability.

(ii) **Preschool through grade 12 education.** With respect to preschool through grade 12 education–deadline.

(I) yearly test records of individual students with respect to assessments under section 1111(b) of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 311[b]);

(II) information on students not tested by grade and subject;

(III) a teacher identifier system with the ability to match teachers to students;

(IV) student-level transcript information, including information on courses completed and grades earned; and

(V) student-level college readiness test scores.

(iii) **Postsecondary education.** With respect to postsecondary education, data that provide

(I) information regarding the extent to which students transition successfully from secondary school to postsecondary education, including whether students enroll in remedial coursework; and

(II) other information determined necessary to address alignment and adequate preparation for success in postsecondary education.

American Recovery and Reinvestment Act of 2009

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h1enr.pdf

Public Law 111–5

111th Congress

An Act

Making supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and state and local fiscal stabilization for the fiscal year ending September 30, 2009; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Section 1. Short Title.

This Act may be cited as the "American Recovery and Reinvestment Act of 2009." (...)

Title VIII. Departments of Labor, Health and Human Services, and Education; and Related Agencies. (...)

Department of Education (...)

Institute of Education Sciences

For an additional amount for "Institute of Education Sciences" to carry out section 208 of the Educational Technical Assistance Act, $250,000,000, which may be used for statewide data systems that include postsecondary and workforce information, of which up to $5,000,000 may be used for state data coordinators and for awards to public or private organizations or agencies to improve data coordination. (...)

Title XIV. State Fiscal Stabilization Fund (...)

Department of Education

State Fiscal Stabilization Fund (...)

For necessary expenses for a State Fiscal Stabilization Fund, $53,600,000,000, which shall be administered by the Department of Education.

General Provisions (...)

Section 14005. State Applications. (...)

(b) Application. In such application, the Governor shall

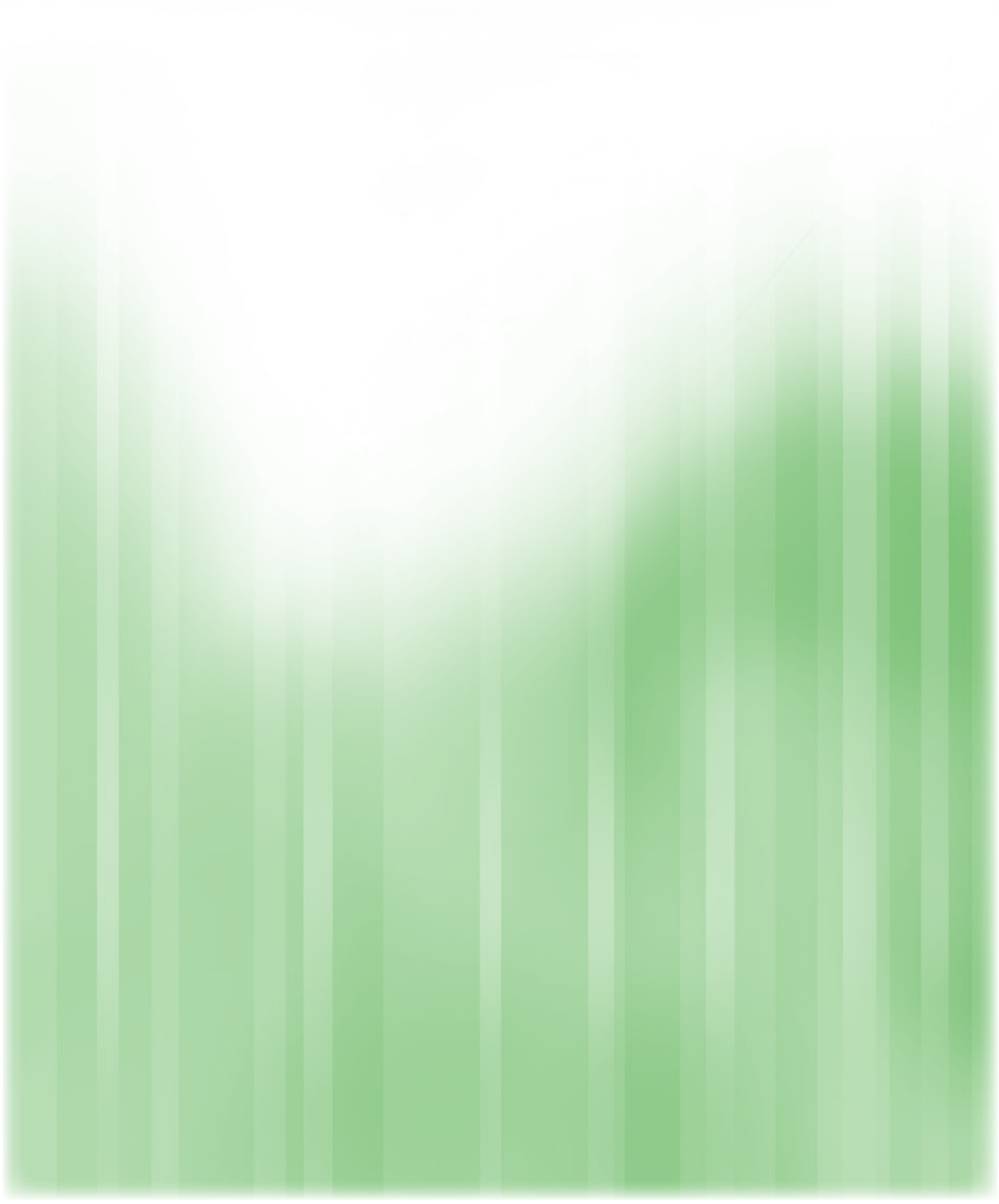
(1) include the assurances described in subsection (d);

(2) provide baseline data that demonstrates the State's current status in each of the areas described in such assurances; and

(3) describe how the State intends to use its allocation, including whether the State will use such allocation to meet maintenance of effort requirements under the Elementary and Secondary Education Act (ESEA) and Individuals with Disabilities Education Act (IDEA) and, in such cases, what amount will be used to meet such requirements. (...)

(d) Assurances. An application under subsection (b) shall include the following assurances: (...)

(3) Improving collection and use of data. The State will establish a longitudinal data system that includes the elements described in section 6401(e)(2)(D) of the America COMPETES Act (20 U.S.C. 9871).



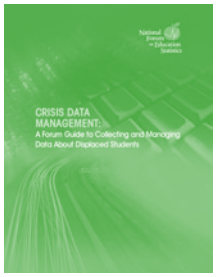
Appendix F
Forum and Other NCES Resources

The Forum Guide to Data Ethics (NFES 2010–801)

http://nces.ed.gov/forum/pub_2010801.asp

Every day, educators collect and use data about students, staff, and schools. Some of these data originate in individual student and staff records that are confidential or otherwise sensitive. And even those data that are a matter of public record, such as aggregate school enrollment, need to be accessed, presented, and used in an ethically responsible manner. While laws set the legal parameters that govern data use, ethics establish fundamental principles of "right and wrong" that are critical to the appropriate management and use of education data in the technology age. This guide reflects the experience and judgment of experienced data managers; while there is no mandate to follow these principles, the authors hope that the contents will prove a useful reference to others in their work.

Crisis Data Management: A Forum Guide to Collecting and Managing Data about Displaced Students (NFES 2010–804)



http://nces.ed.gov/forum/pub_2010804.asp

This publication provides guidelines that can be used by elementary and secondary education agencies to establish policies and procedures for collecting and managing education data before, during, and after a crisis.

The Forum Guide to Metadata: The Meaning Behind Education Data (NFES 2009–805)

http://nces.ed.gov/forum/pub_2009805.asp

This guide offers best practice concepts, definitions, implementation strategies, and templates/tools for an audience of data, technology, and program staff in state and local education agencies. This resource was developed to improve these audiences' awareness and understanding of metadata and, subsequently, the quality of the data in the systems they maintain.

Every School Day Counts: Forum Guide to Collecting and Using Attendance Data (NFES 2009–804)

http://nces.ed.gov/forum/pub_2009804.asp

This guide offers best practice suggestions on collecting and using student attendance data to improve performance. It includes a standard set of codes to make attendance data comparable across districts and states. The publication includes real-life examples of how attendance information has been used by school districts.

NCES Handbooks and NCES Handbooks Online

Handbooks Online

http://www.nces.ed.gov/programs/handbook

The NCES *Handbooks* are a valuable source of metadata for organizations and individuals interested in education data. These print and online resources define standard education terms for students, staff, schools, local education agencies (LEA), intermediate education agencies, and state education agencies (SEA). The Handbooks are intended as reference documents for public and private organizations, including education institutions and early childhood centers; as well as education researchers and other users of education data. In order to improve access to this valuable resource, NCES has also developed the NCES *Handbooks Online,* a web-based tool that allows users to view and download information via an electronic table of contents, a drill-down finder, element name and first letter searches, and advanced query options.

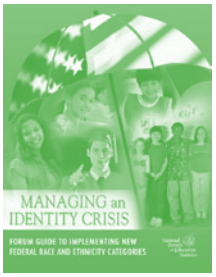
National Education Data Model

National Education Data Model

http://nces.ed.gov/forum/datamodel/index.aspx

The National Education Data Model (NEDM) is the first non-proprietary, national education data model developed to help schools, LEAs, and states design or guide the selection of systems for instructional delivery, data-driven decisionmaking, data collection, operations, and reporting. The model provides a national blueprint to help schools evaluate and improve instructional tools; communicate needs to their umbrella agency or to vendors; enhance the movement of student information from one LEA to another; and, in the end, have better tools to inform instruction. NEDM can be used by educators, vendors, and researchers to understand the information required for teaching, learning, and administrative systems.

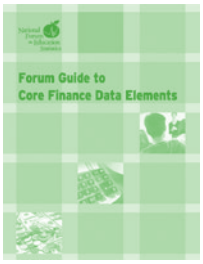
Managing an Identity Crisis: Forum Guide to Implementing New Federal Race and Ethnicity Categories (NFES 2008–802)



http://nces.ed.gov/forum/pub_2008802.asp

This best-practice guide was developed to help state and local education agencies implement the new federal race and ethnicity categories, thereby reducing redundant efforts within and across states, improving data comparability, and minimizing reporting burden. Users may select and adopt strategies that will help them quickly begin the process of implementation in their agencies.

Forum Guide to Core Finance Data Elements (NFES 2007–801)



http://nces.ed.gov/forum/pub_2007801.asp

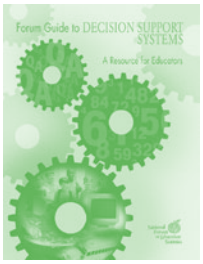
This publication establishes current and consistent terms and definitions for maintaining, collecting, reporting, and exchanging comparable information related to education finances. It is designed to accompany Financial Accounting for Local and State School Systems: 2003 Edition by identifying common reporting requirements and defining frequently used indicators and calculations that use data elements from accounting and other data systems.

Forum Curriculum for Improving Education Data: A Resource for Local Education Agencies (NFES 2007–808)

http://nces.ed.gov/forum/pub_2007808.asp

This resource supports efforts to improve the quality of education data by serving as training materials for K–12 school and district staff. It provides lesson plans, instructional handouts, and other resources; and presents concepts necessary to help schools develop a culture for improving data quality.

Forum Guide to Decision Support Systems: A Resource for Educators (NFES 2006–807)



http://nces.ed.gov/forum/pub_2006807.asp

This Forum guide was developed to help the education community better understand what decision support systems are, how they are configured, how they operate, and how they might be developed and implemented in an education setting.

Forum Guide to Virtual Education (NFES 2006–803)

http://nces.ed.gov/forum/pub_2006803.asp

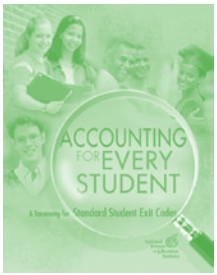
This publication offers recommendations for collecting accurate, comparable, and useful data about virtual education in elementary and secondary education settings. It highlights policy questions and data elements critical to meeting the information needs of policymakers, administrators, instructors, and parents of students involved in virtual education.

Forum Guide to the Privacy of Student Information: A Resource for Schools (NFES 2006–805)

http://nces.ed.gov/forum/pub_2006805.asp

This publication was written to help school and local education agency staff better understand and apply the Family Educational Rights and Privacy Act (FERPA), a federal law that protects the privacy interests of parents and students with respect to information maintained in student education records. It defines terms such as "education records" and "directory information," and offers guidance for developing appropriate privacy policies and information disclosure procedures related to military recruiting, parental rights and annual notification, videotaping, online information, media releases, surveillance cameras, and health-related information.

Accounting for Every Student: A Taxonomy for Standard Student Exit Codes (NFES 2006–804)



http://nces.ed.gov/forum/pub_2006804.asp

This publication was developed to help education agencies develop effective information systems for tracking students' enrollment status. It presents a student-level exit code taxonomy for states and districts that accounts for 100 percent (not 90 or 110 percent) of all students. It also offers "best practice" advice regarding tracking students, collecting exit codes data, and distinguishing among high school completion credentials.

Forum Guide to Education Indicators (NFES 2005–802)

http://nces.ed.gov/forum/pub_2005802.asp

This publication provides encyclopedia-type entries for 44 commonly used education indicators. Each indicator entry includes a definition, recommended uses, caveats and cautions, related policy questions, data element components, a formula, commonly reported subgroups, and display suggestions. The document will help readers better understand how to appropriately develop, apply, and interpret commonly used education indicators.

Forum Guide to Building a Culture of Quality Data (NFES 2005–801)

http://nces.ed.gov/forum/pub_2005801.asp

This publication focuses on data entry: getting things done right at the source. It recommends a practical process for developing a "Culture of Quality Data" based around individual tip sheets for individuals involved in providing data, including principals, teachers, office staff, school board members, superintendents, data stewards, and technology staff.

Forum Unified Education Technology Suite (2005)

http://nces.ed.gov/forum/pub_tech_suite.asp

This publication presents a practical, comprehensive, and tested approach to assessing, acquiring, instituting, managing, securing, and using technology in education settings. It is written for individuals without extensive experience with technology who have been tasked with leading technology initiatives in a school or district setting,.

Forum Guide to Protecting the Privacy of Student Information: State and Local Education Agencies (NCES 2004–330)

http://nces.ed.gov/forum/pub_2004330.asp

This publication presents a general overview of privacy laws and professional practices that apply to information collected for, and maintained in, student records. The guide provides an overview of key principles and concepts governing student privacy; summarizes federal privacy laws; identifies issues concerning the release of information to both parents and external organizations; and suggests good data management practices for schools, districts, and state education agencies.

Facilities Information Management: A Guide for State and Local Education Agencies (NCES 2003–400)

http://nces.ed.gov/forum/pub_2003400.asp

This publication provides a framework for identifying a basic set of school facilities data elements and definitions that will meet the information needs of school and community decisionmakers, school facility managers, and the general public. It presents recommendations for designing and maintaining an information system that addresses the condition, design, use, management, and financing of elementary and secondary education facilities. Commonly used measures, data elements, and additional resources for the practitioner are also included.

Planning Guide for Maintaining School Facilities (NCES 2003–347)

http://nces.ed.gov/forum/pub_2003347.asp

This publication is intended to help school facilities managers plan for efficient and effective operations. It provides practical advice on a range of topics, including how to conduct a facilities audit, plan for maintenance to ensure smooth operations and avoid costly surprises, manage staff and contractors, and evaluate maintenance efforts.

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