

# Investigation of Education Databases in Four States to Support Policy Research on Resource Allocation

POLICY REPORT

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**Investigation of Education Databases in Four States to Support  
Policy Research on Resource Allocation**

Research Report  
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## **Executive Summary**

State policymakers need evidence-based information to help them allocate scarce resources, compensate qualified staff, and determine the effectiveness of education spending. As part of its regional education laboratory work, the Southwest Educational Development Laboratory (SEDL) conducts research to inform policymakers and policy influencers from state legislatures, state departments of education, and governors' offices in Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. In this report, SEDL researchers investigate data collected and managed by state education agencies to determine whether new research can be conducted to support policy questions about education resources and student performance.

Policy questions about education resources and student performance must be addressed to support local, state, and federal education priorities. Expectations for improved performance for all learners have been set by state accountability systems and the federal No Child Left Behind legislation. Increased attention on the resources needed to help students succeed, how these resources should be allocated, and whether spending and staffing strategies affect student performance bring to light the need to examine state data to inform these issues. We conclude that existing state education databases are a critical but underutilized data source that can inform and support policy decision making.

We began this study with an assessment of data utilization in the four study states: Arkansas, Louisiana, New Mexico, and Texas. For this assessment we examined publicly available reports and summaries that used state education data in the four study states and addressed education resource issues. This assessment yielded very few rigorous studies that used existing state data to provide policy guidance on school resource questions. We conclude that researchers and policy audiences need (a) to expand the use of existing education data to support

decision making on instructional resources; (b) to examine data on both resources and student performance to better understand how education inputs and desired outputs relate; and (c) to incorporate data on student, school, and district characteristics when examining education resource issues.

Before these important steps can be followed, however, policy researchers must have a clear understanding of the scope, quality, and availability of existing state data. This report contributes to this understanding by

- describing in fine detail the data collected and housed by state education agencies in Arkansas, Louisiana, New Mexico, and Texas;
- providing guidance to policy audiences and researchers about the questions that can be answered with these data, with discussion about using specific financial, staff, student performance, and student characteristic variables from each study state; and
- discussing ways these data could be improved to expand the range of policy questions answered.

### *Study Methodology*

For this study, we addressed the question “Do state databases allow the investigation of the relationship between fiscal and staff instructional resources and student performance?” In order to assess the capacity of existing state data to conduct such research, we (a) identified the key variables within fiscal and staff instructional resources, student performance, and student, school, and district characteristics needed to analyze critical policy questions; (b) developed criteria to assess the usability of these data; and (c) applied these criteria to identify resource allocation questions that can be answered with state data. We also examined whether commonalities exist in these data across the study states.

*Can Existing State Data Be Used to Investigate Education Resources?*

SEDL researchers found that state data can and should be used for education policy research on instructional resource allocation. Specifically, the researchers concluded the following:

1. Dollars spent to support instruction can be examined using fiscal data broken down by function, object, and program categories. These expenditures also can be examined by accessing staff data that contain individual-level staff salaries.

2. Individual staff salary data also can be linked with staff characteristics such as years of experience, highest degree, and certification information for more comprehensive analysis of staff compensation.

3. Staff resources can be studied using state data, and full-time equivalency (FTE) counts on a wide range of staff categories are available in three of the four study states. Full-time equivalency counts or head counts can be matched with staff demographics or other characteristics or can be used to create staffing ratios such as pupil:teacher or teacher:administrator. Actual class size information, however, is limited with the current data.

4. Student performance data in each of the states are unique and have undergone changes in recent years. Although longitudinal analysis of student outcomes is limited by existing data in most states, student achievement scores can be matched with fiscal and/or staff resources at the school and district levels in all four study states.

5. Student, school, and district characteristics are available in education databases in all four study states and are of critical value in understanding the relative influence of student, school, and district environments on resources and student performance.

*What Can State Policymakers Do to Increase the Use and Quality of Existing State Education Data?*

Based on study findings, we recommend that policymakers, state data managers, and researchers work together to expand the use of state education data for resource allocation research. We also recommend that policymakers and state departments of education support and implement data improvements for greater applicability to informing state policy and find ways to make these data more available and accessible for research use.

1. Policy studies that help decision makers understand the relationship between resources and student performance are extremely rare in the four study states. Given what we learned from this study, policymakers and researchers need to work together to become more familiar with these data and use them to inform decisions. Increased use of existing state education data not only would provide increased information for policymakers but also would fuel a feedback mechanism for states to better understand how data need to be improved or expanded to serve information needs.

2. Applying state education data to policy research purposes is a relatively recent priority and one that is not fully recognized by states, even today. In order for the data needs of policy research to move to the forefront, state policy audiences, data managers, and researchers must provide input on how existing data could be improved and changed for research purposes—in addition to more traditional reporting and monitoring purposes.

3. When considering improvements and changes to state data, policymakers also must balance the time and resource burdens that changes in state data systems create for schools, districts, and state agencies.

4. As this study reveals, critical differences in the variable definitions used by the four study states and the range of information they collect leave researchers with few avenues for pursuing cross-state or regional studies on education resources. Policymakers, data managers, and researchers should maintain a dialogue with national data centers (such as the National Forum for Education Statistics) that attempt to bridge the gap between the unique needs of state data systems and the research benefits of establishing national data standards.

5. We also recommend that policymakers and data managers consider the following targeted improvements to increase the usability of education data for resource allocation research.

- Instructional expenditures at the school level are currently collected only in Texas; the other three study states currently collect this information at the district level. Adding school-level detail of how instructional resources are allocated would enable policy researchers to consider spending needs of schools in varying environments.
- Teacher quality is quickly becoming one of the highest policy priorities due to the federal No Child Left Behind legislation and research results emphasizing the importance of good teachers as a predictor of student success. Data collected on teacher qualifications must align with federal priorities. We recommend that data managers improve the accuracy of teacher years of experience data and ensure that teacher certification data can be easily aligned to the teachers' subject areas and grade levels.
- Class size limits are imposed by both federal and state policy, and the benefits of smaller class sizes have been the topic of intensive study over recent years. In three of the four states, students are not linked to their classroom teachers, so a true estimate

of class size cannot be created. In New Mexico, where data do link students to teachers, access to these data is restricted from outside users. If policymakers are to fully understand the relationship between class size and student success, accurate measures, including data that link individual teachers to specific students or classrooms, must be created for use in policy analysis.

- Professional development is currently unaccounted for in state education databases in the four study states. We recommend that states collect data on the amount and type of professional development that teachers receive and on the costs of investments in professional development to schools and districts. These data are essential to helping policymakers consider the costs and benefits of statewide initiatives to provide professional development to educators.

6. If data are to be shared with outside users such as policy audiences and researchers, accessibility and availability are the critical first steps. We discuss the most important concerns regarding data access and recommend ways for policymakers and state education agencies to improve them.

- Individual-level data are necessary to conduct in-depth analysis of student subgroups and relationships between different types of students, teachers, and resources. Policymakers and data managers should ensure that Family Educational Rights and Privacy Act (FERPA) regulations are interpreted in a consistent manner and should find ways for education agencies to share data from state databases while ensuring confidentiality of individuals.
- Agencies that house state education data should ensure that procedures and staff are in place to assist data users. State education agency staff are a critical support to data

users for data requests, information about data structures and variables, and coordination with the multiple departments or related agencies that collect and manage education data. Clear procedures for data request should be established, and state data managers should communicate the time and cost needed to provide data.

- The multiple departments at state education agencies that collect data should work toward creating centralized data systems that combine the multiple education databases that exist in each state. The Louisiana Educational Accountability Data System (LEADS) is an ongoing effort to implement an integrated data management system to support Louisiana's education information needs. Also, the Texas Public Education Information Resource (TPEIR) database is being developed as a cross-agency data management system that combines primary, secondary, and higher education information. We recommend that state education agencies and policymakers in all states investigate similar initiatives to expand access to state education data.
- Improvements need to be made so that data documentation is consistently available and comprehensive for all state education data. Information on variable definition, type, ranges (if applicable), and year-to-year changes should be made available. Agencies that manage education data should post updated documentation to agency Web sites to increase accessibility to this information.

Based on this study of existing state education data, we conclude that there is a need for increased attention on and use of these data for policy research purposes. We also understand that much work remains to be done by policymakers, state data managers, and researchers to

create high-quality, user-friendly data that can be applied to important policy questions about education resources and student achievement. Such efforts would support the creation of evidenced-based information for policymakers and result in more effective decision making on the resources needed to help children succeed.

## **Chapter 1**

### **Introduction**

Information is one of the most important tools education decision makers need to help them effectively spend taxpayer money, allocate qualified staff, and determine the effectiveness of education investments. Decision makers must understand the role and influence of monetary and staff resources on the education system, and they must have information to help them decide where to invest limited resources for maximum effect on student learning. In this report, researchers from the Southwest Educational Development Laboratory (SEDL) describe the data collected and housed by state education agencies in Arkansas, Louisiana, New Mexico, and Texas. We provide guidance to researchers and state policy audiences, including policymakers and policy influencers from state legislatures, state departments of education, and governors' offices in Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. We provide information about the questions that can be answered with existing data, and we discuss how these data can be improved to answer a wider range of questions. These data hold great promise for answering specific policy questions and should be utilized to their fullest potential to guide effective decision making. The conclusions and recommendations that result from this study will be of interest to policy audiences, data managers, and researchers from the four study states and nationally.

Federal priorities encourage policymakers to seek evidence-based information that combines sound research methods with reliable data. The quality and usability of relevant data, however, are unclear, especially with regard to existing state databases. In the recent past, states' data needs were driven primarily by federal reporting requirements and state accountability priorities. Currently, policymakers are responding to a broader range of financial and

accountability issues than most state data systems were originally designed to track (Busch & Odden, 1997). Therefore, the need to scrutinize state data systems for both policymaking and research purposes has risen in priority. Past research on data use has noted an increase in the accuracy of data as a byproduct of its use, an incentive for both researchers and policymakers to turn to states for their data needs (Farland, 1997).

As part of its mission, SEDL conducts research to inform education policymakers in its five-state region as part of its regional education laboratory work. In their 2003 policy study, SEDL researchers found that instructional resources are positively related to student performance and that strategies exist to allocate resources based on student learning needs. Specifically, we found that high-performing districts in Arkansas, Louisiana, New Mexico, and Texas allocated more fiscal and staff resources to instructional areas than did low-performing districts. We identified two critical strategies that support effective resource allocation: (a) data-driven decision making and (b) alignment of instructional goals with available resources (Pan, Rudo, Schneider, & Smith-Hansen, 2003). Researchers concluded that to improve resource allocation decisions, more information is needed about the relationship between specific instructional resources and student performance.

We shared these findings with state policymakers at an annual state policy forum and during individual visits with policymakers in Arkansas, Louisiana, and Texas. As a result of these meetings we identified the following three areas of need:

1. Policymakers expressed substantial interest in study findings and a need for more information on how effective resource allocation can support student achievement.
2. Policymakers explained that researchers' use of federal databases (i.e., Common Core of Data) to determine resource allocation patterns in the study states weakened the impact of

results. In Texas, for example, state databases report expenditures for instruction across multiple functions depending on the purpose of the spending, whereas federal data aggregate spending in instruction into one function category in order to create a common standard for all states.

Although federal databases provide reliable data that allow comparisons across states, researchers heard from state policymakers a clear need to focus on state-level data. State data, although of varying utility, offer more specific information on spending and staffing patterns within instructional areas than do federal data. State data sources also have increased currency and rely on measures of resources and performance that are typically more familiar to state audiences.

3. Local and state decision makers understand that “one size does not fit all,” and they must consider how resource allocation strategies can be modified to fit local needs and environments. Further work is needed to identify accurate measures of local educational environments (e.g., student demographics, school and district characteristics) and to apply these measures to an examination of instructional resource allocation.

The purpose of this study was to assess the capacity of existing state education databases to answer policy questions about instructional resource allocation and student performance. Existing state databases include organized collections of data managed by state entities for reporting, conducting research, and/or supporting policy and practice. Researchers at SEDL and nationally can use these findings to understand the feasibility and potential scope of using existing state data to conduct research on the allocation of instructional resources. Policymakers and practitioners, by better understanding the capacity of state data systems to conduct policy research, will be able to expand research about instructional resource allocation and student performance.

This report is divided into three major sections with detailed reference material in the appendixes. Chapter 2 describes how data on instructional resources and student performance have been utilized to support policy in Arkansas, Louisiana, New Mexico, and Texas. Chapter 3 describes existing state education data in the four study states and discusses how researchers could use these data to answer policy questions related to instructional resources. We also explore what additional questions could be answered if data were improved. Chapter 4 poses recommendations for policymakers regarding how data might be better utilized and improved to support decision making. Findings on state data in New Mexico are represented in this report; however, these findings are limited and conjectural at times because data were not received from that state for analysis. Information about New Mexico data systems are based solely on printed documentation and interviews with state data managers. The methods used to conduct this study are explained in appendix A, and the remaining appendixes provide detailed descriptions of state education data in each of the four study states for the reader's reference and use in planning future research studies.

## Chapter 2

### Study Findings—Data Utilization in the Southwest Region

Information on instructional resources and student achievement is critical for supporting education policy decisions. In order to better understand how data are used to support policy decisions in the southwestern region, SEDL researchers examined publicly available data reports and summaries, policy analyses, and research studies on resources and student performance that displayed or examined existing data in the four states. We identified reports and research studies that used state data on education resources through Web searches, discussions with state policymakers, and searches of relevant databases such as the Education Resources Information Center (ERIC). The following three areas of data use were targeted for this overview:

1. We sought to better understand which state data have been used to support policy decisions about education resource issues such as state spending levels or teacher resources such as teacher qualifications or compensation.
2. We investigated whether state data have been used to better understand the relationship between resources and student performance.
3. We asked whether previous research included data about student, school, or district characteristics to better interpret results.

From this assessment of data utilization in the four study states, we conclude that state policymakers request and use existing data to understand education resources, especially regarding policy issues such as adequacy and equity of funding. We found research reports and data summaries on fiscal and staff resources in all four states. We also conclude, however, that state education data are not used to their full potential to inform policy issues regarding resources. Researchers have infrequently used existing data in the four study states to answer

research questions on the relationship between resources and student performance and the effect of student, school, or district characteristics. Data use has been largely limited to a few topical areas within the issue of education resources, such as school funding formulas, adequacy of education funding, and descriptive studies of finances and teachers.

### *Education Resource Data and State Policy*

Education researchers and policy analysts have used state data in the four study states to answer questions related to education resources. In Arkansas, litigation prompted the legislature to commission a study of educational resource adequacy, and authors used existing financial and staffing data collected by the Arkansas Department of Education to provide cost estimates for providing adequate resources to schools and districts (Odden, Picus, & Fermanich, 2003). State financial data have been used in similar ways to support fiscal decision making in Louisiana and Texas. For example, state data in Louisiana were compiled for an analysis of education adequacy (Augenblick & Tetreault, 2001), and in Texas, state fiscal data were used to estimate a cost-of-education index for the state funding formula (Alexander, Gronberg, Jansen, Keller, Taylor, & Treisman, 2000).

Researchers and state agencies also have compiled a wide range of descriptive information that could support policy decisions about instructional resources. Three of the four study states make report cards available to the public on the status of schools and districts; these report cards contain limited information about fiscal and/or staff resources. Additionally, the Louisiana State Department of Education (2003a) has examined teacher supply for the state and school districts. That agency has also produced data summaries on school staffing, revenues and expenditures, and salaries for use by the state board (Louisiana Department of Education, 2003b). In New Mexico, limited descriptive data on teacher salaries, school funding, and

pupil:teacher ratios from existing data are used in reports and policy analysis (Legislative Education Study Committee, 2002). A vast array of financial, staffing, and teacher data are available from the Texas Education Agency's Web site, and information has been reported from state data on issues such as teacher mobility and retention (Texas Center for Educational Research, 1999; Texas Education Agency, 1994, 1995).

### *Education Resources and Student Performance*

Although descriptive data that measure education resources do inform policy decisions, of specific interest to us is how policy analysts and researchers have used state data to explore the relationship between student performance and resource allocation. The reports cited above address resource issues; however, they do not link resource allocation to student performance. Evidence that explains this relationship and that also uses existing data from the four study states is limited. No major studies that examine the relationship between fiscal or staff resources and student performance using state data were found for Arkansas or New Mexico, and only a small number of studies were found that used Louisiana and Texas data.

The Louisiana Department of Education recently published results of analyses of state data that examined teacher test scores, finding a relationship between teacher test scores and student performance. Also using Louisiana state data, Crone-Koshel and Singer (2002) compared the performance of schools receiving additional funds for implementing comprehensive school reform programs with Title I schools that did not have additional funds and found no significant differences.

In Texas, several important studies have been conducted. Ferguson (1991) determined that a systematic relationship existed between school resource inputs and student outcomes using state data aggregated to the district level. Hanushek, Kain, and Rivkin (1998) and the Texas

Schools Project used state data to examine the relationship between teachers and student achievement. A resulting working paper suggested a relationship between teacher quality and student outcomes, with teacher quality accounting for at least 7.5 percent of the total variation in student achievement (Hanushek et al., 1998). Another related study examined teacher salaries and found a weak but significant relationship between salaries of experienced teachers and student achievement (Hanushek, Kain, & Rivkin, 1999). These same researchers also examined teacher experience and salaries in schools with low-achieving students and found that experienced teachers are more likely to leave schools because of a disadvantaged, low-achieving student population than because of salary levels (Hanushek, Kain, & Rivkin, 2004). The Texas Legislature commissioned a study to determine the cost of achieving specified levels on student performance. The study examined resource inputs needed to educate students and also considered the different school environments that raise the level of necessary inputs. Authors found significant cost differences for students in different education environments (Gronberg, Jansen, Taylor, & Booker, 2004).

### *Student, School, and District Characteristics*

Policymakers must consider how policy options might be different for schools or communities with different characteristics. Data about the needs of diverse learners could be applied to policy priorities such as narrowing the achievement gap and addressing the resource deficits faced by high-poverty and high-minority schools. As part of this assessment of data utilization, we examined how policy analysts and researchers have incorporated demographic data and other data on students, schools, and districts into investigations of education resources.

SEDL's 2003 resource allocation study found that after controlling for student poverty, student race/ethnicity, student special education status, and district size, significant differences in

resource allocation patterns between high-performing and low-performing districts disappeared (Pan et al., 2003). Other studies have confirmed the importance of considering the influence of demographic characteristics and other variables such as parent education and urban locale on the relationship between resource allocation and student achievement (Betts, Rueben, & Danenberg, 2000; Ferguson & Ladd, 1996; Goldhaber & Brewer, 2000; Roza, Miles, & Foley, 2003).

Researchers in the four study states have used state data to understand the role of demographic factors on student learning. In Louisiana, for example, a number of empirical studies have examined the role of poverty, race, ethnicity, rurality, and school composition on academic achievement (Caldas & Bankston, 1998; Franklin & Glascock, 1998; Kennedy, 1995; Lindsey & Fillippino, 2002). Arkansas researchers have studied the achievement gap between Black and White students and the effect of school size and poverty on academic achievement (Barnett, Ritter, & Lucas, 2003; Johnson, 2002; Mulvenon, Stegman, Ganley, & McKenzie, 2002). Although these studies considered the role of demographic and other school characteristics in education achievement, they did not relate student achievement to education resources. Hanushek et al. (1999) incorporated demographic factors as control variables in their study of teacher resources and used student and family characteristics from the Texas Education Agency database, including race, ethnicity, gender, eligibility for free and reduced-price lunch, and student mobility. Harter (1999) also used data from the Texas Education Agency to examine the differences in resource allocation between high- and low-poverty elementary schools. She concluded that high-poverty schools are more susceptible to the ineffective use of resources.

Based on this assessment of data utilization in the four study states, SEDL researchers conclude that state education data are underutilized and policy audiences need (a) to expand the use of existing education data to support decision making on instructional resources; (b) to

examine data on both resources and student performance to better understand how education inputs and expected outputs relate; and (c) to incorporate data on student, school, and district characteristics when examining education resource issues. To address the feasibility of utilizing existing state education data for policy research, we discuss the availability and usability of these data in the four states in chapter 3. We also consider the policy questions that can and cannot be addressed with existing education data.

### Chapter 3

#### **Study Findings—Can Existing State Education Databases Be Used to Investigate Education Resources and Student Performance?**

The purpose of this study was to explore the capacity of existing state data to answer policy questions about the relationship between instructional resources and student performance. In this chapter we discuss how researchers can use state education data to answer policy questions about three resource areas: (a) instructional expenditures, (b) staff characteristics and teacher quality, and (c) instructional staffing patterns. We also describe student performance data as a desired outcome measure when examining the effectiveness of resource allocation. We describe student, school, and district characteristics data that researchers must consider due to the influence of socioeconomic and other factors on the availability of resources and the level of student outcomes. This analysis represents a regional overview of the four states. State-by-state descriptions of state education data in Arkansas, Louisiana, New Mexico, and Texas are provided in appendixes B–E. We expect that this information will guide researchers and policymakers to make effective use of existing data to answer policy questions. SEDL also expects to use this information to plan and conduct new research to support the improved allocation of resources in diverse state and local environments.

SEDL researchers have particular interest in investigating policy issues in the southwestern region. Our focus for this study was to examine existing state data related to three broad areas of education resources: (a) the allocation of instructional dollars, (b) the importance of staff characteristics, and (c) the distribution of instructional staff. The allocation of instructional dollars addresses policy questions regarding the adequacy and equity of state funding formulas, compensation for teachers and administrators, and other fiscal considerations.

Policy questions about staff characteristics address how the quality of teachers and other staff relates to student success. Resource allocation research on the distribution of instructional staff investigates whether staff with different roles, qualifications, and demographics relate to student learning in different regions, districts, and schools. This chapter discusses the data available in state education databases that are relevant to each of these three resource areas. We provide an overview of overall data quality and discuss the questions that can be answered with existing state data as well as the questions that could be answered if data were improved. We also present the student outcome measures and demographic information available in the four study states.

### *Instructional Expenditures*

Instructional expenditures are collected in state education databases and are generally defined as funds spent to support teaching and learning that occurs in the classroom, such as the cost of teachers, classroom materials and supplies, and contracted instructional services. Financial information can be used to examine spending patterns in instructional and other large expenditure categories such as general administration or support services (Pan et al., 2003).

We investigated whether education data in the four study states could reveal more detailed information regarding how funds are spent within the category of instruction than federal data allow; we found state financial data to be of great potential benefit. As listed in Table 1, in two states, Arkansas and Louisiana, expenditures are organized into function categories that align to federal (Census F-33 form) categories. New Mexico and Texas divide instructional expenditures into two separate function categories. In all four states, financial databases break down instructional expenditures into object-level categories for each school district (see Table 1). Although the objects used in each state vary, these can be loosely categorized into salaries, benefits, contracted services, supplies and materials, and other

expenditures. Using these data, researchers can investigate whether different allocation patterns of object expenditures are related to district performance. Some states have more refined fiscal data. In Texas, instructional object expenditures can be investigated at the school level, and in Texas, Louisiana, and Arkansas, instructional expenditures are further divided into programmatic categories (regular education, special education, etc.). Also, as described in greater detail in appendixes B–E, states have additional subfunction and/or subobject categories that allow even more refined measurement of instructional spending.

Table 1

*Description of the Instructional Expenditure Data Collected by the Four Study States by Function, Object, and Unit of Analysis*

	Arkansas <sup>a</sup>	Louisiana <sup>a</sup>	New Mexico	Texas
Instruction-related function categories	<ul style="list-style-type: none"> <li>• Instruction</li> <li>• Student support</li> <li>• Instructional staff services</li> </ul>	<ul style="list-style-type: none"> <li>• Instruction</li> <li>• Student support</li> <li>• Instructional staff services</li> </ul>	<ul style="list-style-type: none"> <li>• Direct instruction</li> <li>• Instructional support</li> </ul>	<ul style="list-style-type: none"> <li>• Instruction and instruction-related services</li> <li>• Instructional and school leadership</li> <li>• Support services—student</li> </ul>
Object categories	<ul style="list-style-type: none"> <li>• Salaries</li> <li>• Benefits</li> <li>• Professional purchased services</li> <li>• Supplies and materials</li> <li>• Other objects</li> </ul>	<ul style="list-style-type: none"> <li>• Salaries</li> <li>• Benefits</li> <li>• Professional purchased services</li> <li>• Supplies and materials</li> <li>• Other objects</li> </ul>	<ul style="list-style-type: none"> <li>• Personnel services</li> <li>• Employee benefits</li> <li>• Purchased services</li> <li>• Supplies and materials</li> <li>• Travel and training</li> <li>• Capital outlay</li> </ul>	<ul style="list-style-type: none"> <li>• Payroll costs</li> <li>• Professional and contracted services</li> <li>• Supplies and materials</li> <li>• Other operating costs</li> <li>• Debt service</li> <li>• Capital outlay—land, buildings, and equipment</li> </ul>
Unit of analysis	Program (for instruction only) District	Program District	District	Program School District

<sup>a</sup>Function and object categories align with federal functions and objects (Census form F-33).

Researchers also considered whether state education data could support an investigation of spending on individual staff salaries. In addition to the fiscal object category of salaries that is collected at the district and/or school level for all states, state education agencies collect information about the salary paid to each individual staff member (see Table 2). Also contained in staff databases are other characteristics of individual staff, such as the position a staff person holds (teacher, principal, etc.), education level, and demographic information. These data provide a rich source of information for researchers interested in analyzing how instructional staff salaries correspond to staff qualifications or other characteristics.

The benefit of having individual-level data on staff salaries is the flexibility they afford researchers to conduct analyses on subgroups of staff, such as classroom teachers, principals, or aides. They also allow researchers to aggregate salary information to multiple levels (district, school, and grade in some states). Data on the amount spent for individual staff benefits are also available in Arkansas state databases. In New Mexico and in Arkansas prior to 2003, an individual's contracted salary is recorded, but this amount cannot be linked with actual expenditure data recorded in the fiscal database. In Arkansas (since 2003), Louisiana, and Texas, individual staff salary information is recorded with financial function and object category labels so that this information aligns with aggregated salary information in the fiscal database.

Table 2

*Staff Salary Data Available in the Four Study States, Including Salary Measure, Unit of Analysis, Partial Salary Determination, and Benefits*

Salary Data	Arkansas	Louisiana	New Mexico	Texas
Salary measure(s)	• Total salary	• Base salary • Additional compensation (3 types)	• Base pay	• Base pay • Supplemental pay
Unit of analysis	Individual	Individual	Individual	Individual
Can partial salaries be determined for part-time staff?	Yes (since 2003)	Yes	Yes	Yes
Do salary data align with actual expenditures?	Yes (since 2003)	Yes	No	Yes
Are expenditures for benefits available at the individual level?	Yes	No	No	No

*Data Quality.* Data on instructional expenditures vary in quality from state to state. The information about each state's data systems provides detailed state-by-state descriptions of the quality of these data and are located in appendixes B–E as follows:

- Appendix B: Arkansas State Education Data
- Appendix C: Louisiana State Education Data
- Appendix D: New Mexico State Education Data
- Appendix E: Texas State Education Data

Overall, data that measure instructional spending and individual salaries have been consistent over time within each state. With the exception of changes to the Arkansas salary information, few substantive changes have been made in data variables during the study period (1999–2003). This consistency contributes to greater data reliability. State data managers identified few chronic problems in their financial data with regard to accuracy or completeness,

and districts have improved their data reporting systems over the years.<sup>1</sup> Other fiscal categories can be aligned only at the district level in all states except Texas, where fiscal data are reported at the school and program levels, and Arkansas and Louisiana, where district-level instructional expenditures are broken down into program categories. Salary data can be averaged across schools and districts for alignment with other staff data, student performance data, and other indicators.

Spending on staff benefits is recorded at the individual level only in Arkansas, and benefit costs must be prorated across individual staff to estimate total compensation costs in the other three states. Benefits could be estimated in the remaining three states by prorating the total expenditures that a district spends on benefits for instructional staff. This district-level average would need to be applied universally across all staff included in the function category. In most states, this minimally includes teachers, substitutes, and teacher aides, further decreasing the possibility of extracting a usable measure of benefits for any individual staff. Also, information about bonuses or other incentives for teachers in high-demand subject areas or geographic regions are not separated from base salaries except in Louisiana.

*Questions That Can Be Answered.* As shown in Table 3, policy research questions about instructional spending can be answered with existing state education data. State fiscal databases contain expenditure function categories that are familiar to state and local policy audiences, and researchers can examine how instructional dollars are allocated in districts of varying levels of student performance. Student performance scores are necessary for this analysis, and these data are available in each of the four study states, as discussed in greater detail beginning on page 38. Each state compiles test scores on criterion-referenced and/or norm-referenced exams for

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<sup>1</sup> The identification of other important sources of error in these data such as inconsistency in coding data at the district level were beyond the scope of this study.

students in specific grades and subject areas. These test results can be requested from the state for use in resource allocation research. By merging student performance data and fiscal data, researchers can investigate which object-level expenditure categories are more likely to affect student performance. For these analyses, researchers can examine district-level spending in all four states and school-level spending in Texas. Researchers also can compare function-level expenditures to determine if districts of varying levels of performance allocate instructional and administrative dollars differently.

Table 3

*Policy Questions About Instructional Resources That Can be Answered With Existing Data in the Four Study States, Including Relevant Variables and Level of Alignment*

<b>A. Do higher performing districts allocate more instructional dollars to salaries and benefits?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>Expenditure objects within instruction function</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure objects within instruction function</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure objects within direct instruction function</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure objects within instruction and instruction-related services function</li> <li>Student performance scores</li> </ul>
Level at which data can be aligned	District	District	District	School District
Notes	Salaries and benefits constitute a large proportion of object expenditures in instruction, decreasing potential for identifying variation in spending between object categories.			
<b>B. How do districts of varying levels of performance allocate administrative vs. instructional dollars?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>Expenditure functions: instruction, student support, instructional staff services, general administration, school administration</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure functions: instruction, student support, instructional staff services, general administration, school administration</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure functions: direct instruction, instructional support, administration</li> <li>Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>Expenditure functions: instruction and instruction-related services, instructional and school leadership, student support services, administrative support services</li> <li>Student performance scores</li> </ul>
Level at which data can be aligned	District	District	District	School District

Individual-level salary information provides an even greater potential for research and policy and can be applied to important questions. Table 4 displays the relevant variables available in the four states to address such questions. Existing data can investigate the relationship between teacher pay and such desired outcomes as increased student performance or the retention of qualified teachers. These data also can examine whether salaries are distributed equitably between schools and districts. State education data in all four study states allow researchers to investigate the relationship between teacher salaries and student performance at the district and school levels. Grade-level analysis could be conducted with Louisiana, New Mexico, and Texas salary and student performance data. Individual teacher- and student-level analysis could be conducted with New Mexico data.

Salary information also can be linked to teacher experience and mobility in order to examine the effect of pay on retention. Teacher mobility is not a standard variable in existing databases but can be calculated using information on the school and district assignment for teachers over multiple years. Those teachers who change schools or districts over time, or who leave the system altogether, can be recorded as mobile teachers; those who do not change can be recorded as retained teachers. Teacher salary, teacher experience, and school and district identifier data are collected on an individual level, so researchers can examine the relationship between salary and teacher retention at the individual, school, or district level. Teacher qualification data are collected in all four study states as well. These data can help researchers consider whether the relationship between salary and retention changes for teachers of varying education levels, years of experience, or certification status.

The distribution of salaries for teachers and other staff across schools and districts also can be examined using existing data. Distribution of other instructional expenditures (benefits,

supplies and materials, contracted services) can be examined at the district level for all states and at the school level in Texas. Further, these data can be grouped using characteristics such as high- or low-performing school districts to arrive at comparative information on instructional spending.

Table 4

*Policy Questions About Salaries That Can be Answered With Existing Data in the Four Study States, Including Relevant Variables and Level of Alignment*

<b>C. How is teacher pay linked to student performance?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Total pay for teachers</li> <li>• Benefits for teachers<sup>a</sup></li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay or total pay for teachers</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	Grade School District	Individual Grade School District	Grade School District
Notes	<sup>a</sup> 2002–2003 data only			
<b>D. What is the effect of salary on retaining qualified teachers?</b>				
Relevant variables	<ul style="list-style-type: none"> <li>• Total pay for teachers</li> <li>• Years of experience</li> <li>• Mobility of teachers (calculated)</li> <li>• Certification</li> <li>• Education level</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay or total pay for teachers</li> <li>• Years of experience</li> <li>• Mobility of teachers (calculated)</li> <li>• Certification</li> <li>• Education level</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Years of experience</li> <li>• Mobility of teachers (calculated)</li> <li>• Certification</li> <li>• Education level</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Years of experience</li> <li>• Mobility of teachers (calculated)</li> <li>• Certification</li> <li>• Education level</li> </ul>
Level at which data can be aligned	Individual School District	Individual School District	Individual School District	Individual School District
Notes	Certification information is limited due to lack of issue dates.			
<b>E. Are teacher salaries distributed equitably between schools and districts?</b>				
Relevant variables	Total pay for teachers	Base pay for teachers	Base pay for teachers	Base pay for teachers
Level at which data can be aligned	School District	School District	School District	School District
Notes	Data from non-education databases could also be used to support this analysis, such as cost-of-living indicators.			

*Questions That Could be Answered With Additional Data.* Additional data that would enable policy researchers to address a wider range of questions regarding instructional spending include better measures for total compensation and professional development. As mentioned above, salary information is available for individual staff persons; however, data on dollars spent on benefits are available at the individual staff level in only one state. If all states were to collect individual-level data on the cost of benefits, bonuses, and incentives, researchers could calculate a more accurate estimate of total staff compensation. These more refined data also could be used to examine the influence of benefits and incentives on teacher recruitment or the successful use of incentives for hiring and retaining teachers in shortage areas (bilingual education, special education, etc.).

Professional development is another area of instructional spending and a policy issue about which decision makers need information. No fiscal spending category or individual staff data elements currently exist to help policy researchers understand how investments in professional development for teaching staff improve student outcomes. Researchers need actual or dollar-equivalent measures for teacher time, stipends, travel expenses, and costs for teacher substitutes related to professional development that can be prorated or directly assigned to individual teachers. The No Child Left Behind legislation emphasizes the importance of tracking the number of hours a teacher spends in professional development. Information on the content of professional development for teachers is also needed. Researchers could use these data to address questions about the effectiveness of professional development, its relative costs, and the distribution of professional development resources across schools and districts.

### *Staff Characteristics Data and Teacher Quality*

Data on staff characteristics are important for policy audiences who need to understand the contribution of instructional and administrative staff in the learning process. A major emphasis within staff-related policy concerns is the qualifications of teachers. A number of critical policy questions need answers so that states can make research-based decisions to improve teacher quality. Questions that can be investigated using existing state data include those related to teacher experience, education, and certification.<sup>2</sup>

As displayed in Table 5, teacher characteristics data available across the four study states are relatively similar. For each of the states, researchers can measure basic demographics of teachers, educational attainment, years of experience, and scores on state teacher tests. Each of the four states also collects, minimally, data on teacher certification type, grade level, and subject area. All states except New Mexico also collect the issue date and expiration date of the certification, and Arkansas and Louisiana track national board certification. Arkansas, Louisiana, and Texas record teachers' route to certification (traditional or alternative). All states except Arkansas provide data to measure the proportion of a full-time equivalency (FTE) position a teacher holds. All four study states collect data on individual teachers, and these data can be linked to school and district identifiers for analysis at these aggregated levels. In New Mexico, teachers are linked to students through class codes and identification numbers.<sup>3</sup>

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<sup>2</sup> These areas represent some important and easily quantifiable indicators of teacher quality. However, it is important to note that other measures of quality such as application of pedagogical techniques, teacher motivation, and classroom management skills are not collected via state databases.

<sup>3</sup> Louisiana began linking individual students and teachers beginning in 2004-2005; however, these data are beyond the time period of this study and were not examined for this report.

Table 5

*Teacher Characteristics Data Available in State Databases in the Four Study States, Including Characteristics Variables, Certification Data, and Level of Alignment*

	Arkansas	Louisiana	New Mexico	Texas
Teacher characteristics	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Birth date</li> <li>• Years of experience</li> <li>• Lowest and highest degree</li> <li>• Highest degree institution</li> <li>• Score on teacher tests</li> </ul>	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Full-time equivalency of position</li> <li>• Years of experience</li> <li>• Highest degree institution</li> <li>• Score on teacher tests</li> </ul>	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Birth date</li> <li>• Full-time equivalency of position</li> <li>• Years of experience</li> <li>• Highest degree</li> <li>• Bachelor’s degree and highest institution</li> <li>• Score on teacher tests</li> </ul>	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Birth date</li> <li>• Full-time equivalency of position</li> <li>• Years of experience</li> <li>• Highest degree</li> <li>• Bachelor’s degree institution</li> <li>• Score on teacher tests</li> </ul>
Teacher certification data	<ul style="list-style-type: none"> <li>• Type</li> <li>• Grade level</li> <li>• Subject area</li> <li>• Effective date</li> <li>• National board</li> <li>• Route to certification</li> </ul>	<ul style="list-style-type: none"> <li>• Type</li> <li>• Grade level</li> <li>• Subject area</li> <li>• Effective date</li> <li>• National board</li> <li>• Route to certification</li> </ul>	<ul style="list-style-type: none"> <li>• Type</li> <li>• Grade level</li> <li>• Subject area</li> </ul>	<ul style="list-style-type: none"> <li>• Type</li> <li>• Grade level</li> <li>• Subject area</li> <li>• Effective date</li> <li>• Route to certification</li> </ul>
Level at which data are available or can be aligned	Individual School District	Individual School District	Individual School District	Individual School District

*Data Quality.* Data measuring staff characteristics are, for the most part, of sufficient quality to be used for policy research purposes. Data on teachers are more extensive than other staff data and include individual-level information on experience, education levels, certification status, and teacher test scores. Teacher data are relatively accessible by special request to state education agencies because individual staff data are protected with a lower level of confidentiality than individual student data.<sup>4</sup> A number of challenges related to teacher data,

<sup>4</sup> For those states that use Social Security numbers as unique identifiers, these numbers must be stripped or scrambled by the education agency before release to the outside users.

however, limit the usability of these data to answer policy questions. According to interviews with data managers across the four states, teacher experience data are of limited reliability due to reporting error at the level of local collection. Also, teacher certification information is problematic for three reasons:

1. Teacher certification data are collected and managed by a separate department from that which collects and manages other teacher data, increasing the probability of misalignment when merging these two sets of data. This problem is most apparent in states where different agencies use different unique identifiers or must scramble unique identifiers for outside data users.

2. Teacher certification data are collected in databases that are cumulatively updated without year-to-year archive information on teachers.

3. Certification requirements and teacher tests change frequently, making longitudinal analysis of certified teachers extremely difficult.

*Policy Questions That Can Be Answered.* As presented in Table 6, existing data on teachers can answer policy questions about teacher education, years of experience, certification, and teacher test scores. Teacher information is used in standard reporting by state education agencies, and teacher years of experience and education data are used to determine teacher salary levels. All four study states collect the total number of years a teacher has been in the profession, which can be used to examine the relationship between teacher experience and student achievement. The quality of these data varies from state to state and is dependent on unverified self-reports from either individual teachers or school districts. As summarized in Table 6, these data can be used to explore the relationship between teacher experience and student achievement. In order to address the relative unreliability of the self-reported experience information,

researchers may choose to crosscheck these data across a span of years. Since teachers and students are not aligned in state databases, except in New Mexico, researchers need to aggregate data to school or district levels in the remaining three states.

Researchers also can use state data to address the relationship between teacher education and student achievement (see Table 6). Teacher education variables in the four study states include highest degree and degree institution. Degree data usually include bachelor's, master's, and doctoral levels. Degree institution data are limited because in all four states only the names of in-state institutions attended are collected, and states use a universal label for out-of-state degrees.

Teacher certification is another important area of policy research that can be supported with state data, as shown in Table 6. Certification data in the four states are compiled in a separate database from other staff data and are managed by a department or agency whose prime responsibility is overseeing the licensure or certification of teachers. Measures available for teacher certification in each of the four study states include the certification type, subject area, and grade level. Arkansas, Louisiana, and Texas also track teachers' route to certification, and Texas provides an estimate of the number of teachers in each school who are teaching in their field of certification. This estimate of in-field teachers, however, is imprecise because elementary teachers do not teach specific subject areas and secondary teachers potentially teach multiple subjects. Also, the in-field determination does not consider teachers' degree major, which is not currently collected by any of the four study states. Arkansas and Louisiana also collect data on whether a teacher is national board certified. It is important to note that teacher certification data in New Mexico are limited with regard to their usability for policy research. As described above, teacher certification databases are organized in a cumulative fashion, so the

issue date and expiration date of certifications are essential for conducting analysis on these data. In New Mexico, the certification database lacks dates when certifications were granted or expired, making it impossible to identify whether or not a teacher was certified during any given study period.

Scores on teacher tests are also available in state databases for teachers in all study states. These data represent an array of test scores because teachers have had the option to take one of a number of tests or required tests have changed from year to year. Researchers can conduct analysis of subsets of teachers who took the same exam or explore the possibility of standardizing scores across different exams. Teachers in some states have no test score information if they were certified before testing requirements were instituted. Also, since teachers are assessed on a pass/fail basis and test takers may not be motivated to score as high as possible, test scores may reflect an inaccurate level of teachers' knowledge.

Table 6

*Policy Questions About Teachers That Can be Answered With Existing Data in the Four Study States, Including Relevant Variables and Level of Alignment*

<b>F. What is the relationship between teacher experience and student achievement?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Years of experience in the profession</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Years of experience in the profession</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Years of experience in the profession</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Years of experience in the profession</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	Individual School District	School District
Notes	Experience data are not fully reliable due to self-reporting error. Researchers may choose to crosscheck these data across a span of years.			
<b>G. What is the relationship between teacher education and student achievement?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Highest degree</li> <li>• Degree institution</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Highest degree</li> <li>• Degree institution</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Highest degree</li> <li>• Degree institution</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Highest degree</li> <li>• Degree institution</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	Individual School District	School District
Notes	<ul style="list-style-type: none"> <li>• Degree major not available</li> <li>• Out-of-state degree institutions are not specified</li> </ul>			

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**H. What is the relationship between teacher certification and student achievement?**


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	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Route to certification</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Route to certification</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• Route to certification</li> <li>• In-field teacher</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	School District	School District
Notes			Certification status data are problematic due to lack of issue dates.	In-field teacher data are estimated and may not be a reliable measure.

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**I. What is the relationship between teacher test scores and student achievement?**


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	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Teacher test score</li> <li>• Student performance score</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher test score</li> <li>• Student performance score</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher test score</li> <li>• Student performance score</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher test score</li> <li>• Student performance score</li> </ul>
Level at which data can be aligned	School District	School District	School District	School District
Notes	Teacher test score data are an inconsistent measure due to variability in tests over time and the pass/fail nature of the tests. This question can be answered using data on subsets of teachers, which may bias results.			

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Data on teacher experience, education, and certification in the four study states can be merged with other variables to answer additional policy questions (see Table 7). Researchers can, for example, merge teacher characteristics and teacher salary information at the individual staff level in all four states and ask whether higher teacher salaries buy teachers with more experience, higher education levels, and advanced certification status. Researchers also can use teacher data to examine the distribution of teachers who were educated at different teacher education institutions or to determine whether rural areas have a higher rate of uncertified

teachers. Arkansas, Louisiana, and Texas data can inform studies regarding the relationship between teacher retention and route to certification.

Table 7

*Additional Policy Questions About Teachers That Can be Answered With Existing Data in the Four Study States, Including Relevant Variables and Level of Alignment*

**J. Do higher teacher salaries buy teachers with more experience, higher education levels, and advanced certification status?**

	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Total pay for teachers</li> <li>• Years of experience in the profession</li> <li>• Highest degree</li> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Years of experience in the profession</li> <li>• Highest degree</li> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Years of experience in the profession</li> <li>• Highest degree</li> <li>• Certification type, subject area, and grade level</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Base pay for teachers</li> <li>• Years of experience in the profession</li> <li>• Highest degree</li> <li>• Certification type, subject area, and grade level</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	Individual School District	School District
Notes	Certification status data are problematic due to lack of issue dates. Experience data are not fully reliable due to self-reporting error. Researchers may choose to crosscheck these data across a span of years.			

**K. What is the pattern of distribution of teachers who were educated at different teacher education institutions?**

	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Degree institution</li> <li>• School code</li> <li>• District code</li> </ul>	<ul style="list-style-type: none"> <li>• Degree institution</li> <li>• School code</li> <li>• District code</li> </ul>	<ul style="list-style-type: none"> <li>• Degree institution</li> <li>• School code</li> <li>• District code</li> </ul>	<ul style="list-style-type: none"> <li>• Degree institution</li> <li>• School code</li> <li>• District code</li> </ul>
Level at which data can be aligned	School District	School District	School District	School District
Notes	Data do not designate specific out-of-state degree institutions but use a generic code for all such institutions.			

**L. Do rural areas have a higher rate of uncertified teachers?**

	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Locale code</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• National board certification</li> <li>• Locale code</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• Locale code</li> </ul>	<ul style="list-style-type: none"> <li>• Certification type, subject area, and grade level</li> <li>• Locale code</li> </ul>
Level at which data can be aligned	School District	School District	School District	School District
Notes	Certification status data are problematic due to lack of issue dates. Locale codes for schools and districts are located in federal Common Core of Data.			

**M. What is the relationship between teacher retention and route to certification?**

	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• School code (multiple years)</li> <li>• District code (multiple years)</li> <li>• Route to certification</li> </ul>	<ul style="list-style-type: none"> <li>• School code (multiple years)</li> <li>• District code (multiple years)</li> <li>• Route to certification</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• School code (multiple years)</li> <li>• District code (multiple years)</li> <li>• Route to certification</li> </ul>
Level at which data can be aligned	School District	School District	N/A	School District
Notes	Teacher mobility/retention can be inferred by comparing teachers' school and district assignment codes over multiple years. During the study period New Mexico did not have an alternative route to certification.			

*Questions That Could be Answered With Additional Data.* Improved and expanded collection of teacher characteristics would improve policy research on teacher issues. For example, although teacher experience is measured in all four study states, these states could improve the reliability of the measures for research use by helping districts better understand reporting definitions of this variable—especially for teachers who transfer between districts. Also, none of the four study states collect information to estimate accurately whether a teacher is teaching in-field based on his or her degree major. This measure is a critical component of “highly qualified teachers” as defined by the No Child Left Behind Act. If states would collect data on teachers’ degree major, researchers could align these data with the subject area the teacher is certified to teach and the subject the teacher actually teaches to estimate the number, distribution, and effectiveness of in-field teachers.

Teacher retention and mobility are important measures that researchers currently can calculate using teacher school and district assignment codes over time. If states included a teacher mobility measure in state education databases, this would provide a consistent measure for researchers and would reduce error and variability in the way outside data users calculate mobility. Teacher test score data are limited for research purposes and must be used with caution for reasons beyond data collection and management. These data reflect multiple teacher tests that have changed over time, making comparisons between teachers difficult except for subsets of teachers and for specific years. The pass/fail scoring structure also reduces the accuracy of teacher test scores as a measure of teachers’ knowledge. This measure could be improved by creating a universal standard for teacher tests and by adding incentives for teachers to score as high as possible on the tests.

### *Instructional Staffing Patterns*

As discussed above, policy questions about teacher resources can be investigated using existing state education databases. As presented in Table 8, staff counts and ratios are collected by the four study states and can be used to inform policy. The states also collect detailed information on all classified and certified staff, including salaries, position, years of experience, gender, and race/ethnicity. Other characteristics that are collected on all staff in one or more of the four study states include educational attainment and degree institution. Staff databases in Louisiana, New Mexico, and Texas also include information about the full-time equivalency (FTE) of staff positions, allowing researchers to determine staff allocations with more precision than staff head counts permit. In Arkansas, Louisiana, and Texas, for individuals with multiple job positions, researchers can determine what proportion of an individual salary compensates each position. Individual staff records also contain school assignment, making it possible for researchers to build staff profiles for a specific school or subgroup of schools. School-level staff ratios can be calculated or combined with student enrollment data to create student and staff ratios (pupil:teacher, pupil:administrator, teacher:administrator, teacher:aide, etc.).

Class size is an important data variable for conducting policy research. Policy audiences need to understand the relative cost of reducing class size and its relationship to student performance. Class size information can be estimated in a variety of ways with varying accuracy. A calculation of the ratio between the number of students in a school and the number of teachers in the school is the least accurate measure of class size due to (a) the probability that not all teachers in a school are regular classroom teachers, (b) the fact that in most secondary schools teachers are assigned to multiple classes, and (c) the possibility that team teaching or other nontraditional classroom structures exist. As shown in Table 8, in Arkansas and Texas existing

data allow researchers to calculate pupil:teacher ratios (Texas also calculates a pupil:class ratio in secondary schools). However, in Arkansas this ratio must be calculated with a head count of teachers, rather than the more refined full-time equivalency (FTE) count of teachers. A more accurate measure of class size is available in Louisiana, where local school districts track and report actual class sizes to the state. In New Mexico, the databases are structured so that researchers, theoretically, can link teachers to the students they teach in specific classes to calculate a relatively accurate class size measure.<sup>5</sup>

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<sup>5</sup> As of this writing SEDL researchers could not test whether class size could actually be computed due to unavailability of data from the New Mexico Public Education Department.

Table 8

*Information on Classified and Certified Staff Available in State Databases for the Four Study States, Including Counts, Staff Categories, Characteristics, Class Size Estimates, and Ratios*

	Arkansas	Louisiana	New Mexico	Texas
Staff counts	<ul style="list-style-type: none"> <li>• Head count</li> </ul>	<ul style="list-style-type: none"> <li>• Head count</li> <li>• Full-time equivalency (FTE) by position</li> </ul>	<ul style="list-style-type: none"> <li>• Head count</li> <li>• Full-time equivalency (FTE) by position</li> </ul>	<ul style="list-style-type: none"> <li>• Head count</li> <li>• Full-time equivalency (FTE) by position</li> </ul>
Type of staff included	<ul style="list-style-type: none"> <li>• Classified and certified staff</li> </ul>	<ul style="list-style-type: none"> <li>• All staff</li> </ul>	<ul style="list-style-type: none"> <li>• Classified and certified staff</li> </ul>	<ul style="list-style-type: none"> <li>• Classified and certified staff</li> </ul>
Staff characteristics	<ul style="list-style-type: none"> <li>• Position</li> <li>• Years of experience</li> <li>• Education level</li> <li>• Degree institution</li> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Birth date</li> </ul>	<ul style="list-style-type: none"> <li>• Position</li> <li>• Years of experience</li> <li>• Education level</li> <li>• Gender</li> <li>• Race/ethnicity</li> </ul>	<ul style="list-style-type: none"> <li>• Position</li> <li>• Years of experience</li> <li>• Education level</li> <li>• Degree institution</li> <li>• Gender</li> <li>• Race/ethnicity</li> <li>• Birth date</li> </ul>	<ul style="list-style-type: none"> <li>• Position</li> <li>• Years of experience</li> <li>• Education level</li> <li>• Gender</li> <li>• Race/ethnicity</li> </ul>
Class size estimate	Pupil:teacher ratio can be calculated using teacher head count, not full-time equivalency count.	Class size ranges are reported at the school level.	Potential to compute class size using individual-level student, teacher, and class data	Pupil:teacher ratio and pupil:class ratio (secondary) are available in state data.
Staff ratios	Can be calculated (using head count not full-time equivalency count): <ul style="list-style-type: none"> <li>• Pupil:teacher</li> <li>• Pupil:administrator</li> <li>• Teacher:administrator</li> </ul>	Can be calculated: <ul style="list-style-type: none"> <li>• Pupil:teacher</li> <li>• Pupil:administrator</li> <li>• Teacher:administrator</li> </ul>	Can be calculated: <ul style="list-style-type: none"> <li>• Pupil:teacher</li> <li>• Pupil:administrator</li> <li>• Teacher:administrator</li> </ul>	Can be calculated: <ul style="list-style-type: none"> <li>• Pupil:teacher</li> <li>• Pupil:administrator</li> <li>• Teacher:administrator</li> </ul>

*Data Quality.* Staff data in all four study states are collected at the individual level and are of sufficient quality for research use. Individual-level data can be requested from state education agencies, and aggregated reports of these data are available from state agency Web sites. Data collection procedures for staff data have been in place for many years and have not changed substantially during the study period (1999–2003) except in Arkansas. The consistency and relatively clear and detailed reporting instructions for districts contribute to the quality of

staff data. Since data are collected for individual staff and relevant school or district labels are attached to these data, they provide great potential for aligning to student performance data, student characteristics, and school and district characteristics. Researchers also must realize the complexity of staff data. Understanding, for example, how teachers with multiple roles and responsibilities are recorded in each state's databases requires careful study of the data documentation and/or conversations with state data managers.

*Questions That Can be Answered.* The four study states all collect individual-level staff data that provide flexibility for policy research about staffing patterns. Using staff full-time equivalency (FTE) counts, researchers can estimate staff resources by position at every school. Combined with student performance data, researchers can investigate how staff resources differ across schools with varying student performance levels (see Table 9). Such analyses can be conducted at the school or district level. Researchers also can use demographic data that are collected in each of the four study states (for a description of available demographic data, see the discussion beginning on page 38) and staff characteristics, such as years of experience or race/ethnicity, to better understand the distribution of staff. For example, researchers can examine the distribution of teachers and administrators with varying years of experience in small, medium, and large schools.

Researchers also can use pupil:staff ratios to understand whether allocating more administrators, teachers, or aides is related to student performance (see Table 9). For example, all four study states collect data to study how class size relates to student performance. As discussed above, estimates for class size would vary from pupil:staff ratios to actual reported class sizes, depending on the data available in each state.

Table 9

*Policy Questions About Staff Resources That Can be Answered Using State Data in the Four Study States, Including Relevant Variables and Level of Alignment*

<b>N. How do staff resources differ across schools with varying student performance levels?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Staff head count</li> <li>• Staff position code</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Staff full-time equivalency (FTE) count</li> <li>• Staff position code</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Staff full-time equivalency (FTE) count</li> <li>• Staff position code</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Staff full-time equivalency (FTE) count</li> <li>• Staff position code</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	School District	School District
Notes	FTE data are not available.			
<b>O. What is the distribution of teachers and administrators with varying years of experience in small, medium, and large schools?</b>				
	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Teacher head count</li> <li>• Administrator head count</li> <li>• Years of experience</li> <li>• School enrollment</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher full-time equivalency (FTE) count</li> <li>• Administrator full-time equivalency (FTE) count</li> <li>• Years of experience</li> <li>• School enrollment</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher full-time equivalency (FTE) count</li> <li>• Administrator full-time equivalency (FTE) count</li> <li>• Years of experience</li> <li>• School enrollment</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher full-time equivalency (FTE) count</li> <li>• Administrator full-time equivalency (FTE) count</li> <li>• Years of experience</li> <li>• School enrollment</li> </ul>
Level at which data can be aligned	School	School	School	School

**P. What is the relationship between class size and student performance levels?**

	Arkansas	Louisiana	New Mexico	Texas
Relevant variables	<ul style="list-style-type: none"> <li>• Teacher head count</li> <li>• Enrollment</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Class size range</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Student, teacher, and class ID</li> <li>• Student performance scores</li> </ul>	<ul style="list-style-type: none"> <li>• Pupil:teacher and pupil:class ratios</li> <li>• Student performance scores</li> </ul>
Level at which data can be aligned	School District	School District	Class School District	School District
Notes	<ul style="list-style-type: none"> <li>• Class size is not estimated in state data</li> <li>• Pupil:teacher ratio can be calculated</li> </ul>	<ul style="list-style-type: none"> <li>• Class size ranges: 1–20, 21–26, 27–34, more than 34</li> </ul>	<ul style="list-style-type: none"> <li>• Class database aligns student, teacher, and class ID that can be aggregated to estimate class size</li> </ul>	<ul style="list-style-type: none"> <li>• Pupil:teacher (elementary) and pupil:class (secondary) ratios are in state data</li> </ul>

*Questions That Could be Answered With Additional Data.* The relationship between class size and student performance is of interest at both the state and federal levels of education decision making. If data were collected that link students to teachers and teachers to specific classes in all four study states, this policy issue could be investigated more accurately.

*Student Performance Data and Student, School, and District Characteristics*

Student performance data and demographic data on students, schools, and districts are critical elements for conducting research on resource allocation and student performance. Student performance data provide important measures of school and district success. Policy analysis that includes student achievement data can uncover resource strategies and inputs that relate to improved student performance. Demographic information is useful for two reasons. First, demographic characteristics such as student poverty and minority status are known to influence student performance measures and must be accounted for when investigating the relationship between resources and student performance. Second, demographic characteristics

can help researchers identify—and policymakers understand—specific resource needs, circumstances, and barriers faced by schools and districts with varying wealth, geographic characteristics, and student populations.

Student performance data described in this report include only scores on student achievement tests compiled and managed by state education agencies in each of the four study states (see Table 10). Other measures of student performance such as attendance and graduation rates are not discussed in this report. Student achievement testing generally reflects instructional goals and priorities established by state policymakers and thus vary from state to state. States use norm-referenced exams, criterion-referenced exams, or both for student accountability purposes. Standardized test scores are available for varying grades and subject areas, depending on state requirements. All states have tests for core subject areas (math, reading or English language arts) and other subjects such as science and social studies. In all four states, tests have changed over the years and grades tested have changed, making longitudinal comparisons difficult over long time spans. Student test scores are recorded for each individual student tested. Additionally, basic demographic information about the student, such as poverty status and race/ethnic group, is attached to performance records. Scores also can be aggregated to grade, school, and district levels.

Table 10

*Student Achievement Tests Used in the Four Study States by Test Name and Grades and Subject Areas Tested*

	Arkansas	Louisiana	New Mexico	Texas
Tests	<ul style="list-style-type: none"> <li>• State benchmark tests (criterion-referenced)</li> <li>• Stanford Achievement Test, 9th edition (SAT-9) (norm-referenced)</li> </ul>	<ul style="list-style-type: none"> <li>• Louisiana Educational Assessment Program for the 21st Century (LEAP 21) (criterion-referenced)</li> <li>• Iowa Tests of Basic Skills (ITBS)/Iowa Tests of Educational Development (ITED) (norm-referenced)</li> </ul>	<ul style="list-style-type: none"> <li>• Terra Nova (norm-referenced)</li> </ul>	<ul style="list-style-type: none"> <li>• Texas Assessment of Academic Skills (TAAS) (criterion-referenced)</li> <li>• Texas Assessment of Knowledge and Skills (TAKS) (criterion-referenced)</li> </ul>
Grades	<ul style="list-style-type: none"> <li>• 4, 6, 8—State benchmark tests</li> <li>• 5, 7, 10—Stanford Achievement Test, 9th edition (SAT-9)</li> </ul>	<ul style="list-style-type: none"> <li>• 4, 8—Louisiana Educational Assessment Program for the 21st Century (LEAP 21)</li> <li>• 3, 5, 6, 7, 9—Iowa Tests of Basic Skills (ITBS)/Iowa Tests of Educational Development (ITED)</li> <li>• 10, 11—Graduation Exit Exam</li> </ul>	<ul style="list-style-type: none"> <li>• 3–9—Terra Nova</li> </ul>	<ul style="list-style-type: none"> <li>• 3–8, 10—Texas Assessment of Academic Skills (TAAS)</li> <li>• 3–11—Texas Assessment of Knowledge and Skills (TAKS)</li> </ul>
Subjects	<ul style="list-style-type: none"> <li>• Math, reading, writing—State benchmark tests</li> <li>• Complete battery—Stanford Achievement Test, 9th edition (SAT-9)</li> </ul>	<ul style="list-style-type: none"> <li>• English language arts, mathematics, science, social studies—Louisiana Educational Assessment Program for the 21st Century (LEAP 21)</li> <li>• Reading, language, mathematics, science, social studies—Iowa Tests of Basic Skills (ITBS)/Iowa Tests of Educational Development (ITED)</li> </ul>	<ul style="list-style-type: none"> <li>• Math, reading, language arts, science, social studies</li> </ul>	<ul style="list-style-type: none"> <li>• Math, reading, writing, science, social studies</li> </ul>
Notes	<ul style="list-style-type: none"> <li>• For the State Benchmark test, 4th grade was added in 1999, 8th grade was added in 2000, and 6<sup>th</sup> grade was added in 2001.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing of different grade levels and subject areas have been phased in gradually since 1999–2000.</li> </ul>	<ul style="list-style-type: none"> <li>• The Terra Nova changed formats in 2002–2003.</li> <li>• The state plans to replace the Terra Nova with a criterion-referenced exam (grades 3–9, 11) by 2005–2006.</li> </ul>	<ul style="list-style-type: none"> <li>• The Texas Assessment of Knowledge and Skills replaced the Texas Assessment of Academic Skills in 2002–2003.</li> </ul>

*Data Quality.* Due to increased attention to accountability needs, all four study states have been improving their capacity to measure student performance through standardized tests. While this process has improved the quantity of these data with regard to the number of tests offered and the grades tested, it also has resulted in inconsistency in the test scores available from year to year. In each of the four study states, changes were made during the study period to the tests administered, grades tested, or scoring standards. These changes are important for researchers to consider, especially in applying these data to analysis across time. Data are reported through state agency Web sites in all study states except New Mexico. These publicly available data, however, are limited for use in policy research because they are not disaggregated to reflect individual level scores or, in some states, subgroup populations. These data also are reported using aggregated scoring formats (e.g., percentage of students scoring at or above proficient level) of limited value to researchers. Researchers can request data from state departments of education that provide more refined measures of student achievement than those available on agency Web sites.

*Student, School, and District Characteristics.* State education databases contain student, school, and district demographic data. Key demographic measures in the four states are listed in Table 11. Student poverty is measured by student participation in the free and reduced-price lunch program. All study states except New Mexico have collected these data in a consistent manner during the study period. Student race/ethnicity, gender, special education status, and participation in limited-English-proficient or gifted and talented programs are collected in education databases in all four states. School characteristics available in state databases include the type of school, the grades taught, student enrollment, school accountability ranking, and aggregated student characteristic data such as percentage of minority or high-poverty students.

District characteristics of interest to policy researchers include district wealth, geographic locale, district enrollment, and district/school accountability rating. District wealth is calculated as part of state funding formulas and is available for all four study states. Geographic locale (urban, rural, suburban, etc.) is available for Texas districts in state databases. A more standardized source of this information, however, is located at the federal level. The National Center for Education Statistics Common Core of Data produces a geographic locale label for each school and district in all states in the nation.

Table 11

*Unit of Analysis Possible for Student, School, and District Characteristics in the Four Study States*

Measure	Arkansas	Louisiana	New Mexico	Texas
Poverty status (free and reduced-price lunch program participation)	Grade School District	School District	Grade School District	Grade School District
Race/ethnicity	Grade School District	School District	Grade School District	Grade School District
Gender	Grade School District	School District	Grade School District	Grade School District
Special program participation (special ed., bilingual, Title I, etc.)	Grade School District	School District	Grade School District	Grade School District
School type (elementary, high, etc.)	School	School	School	School
Grade range	School	School	School	School
Total enrollment	School District	School District	School District	School District
Per pupil expenditure	District	School (estimated) District	District	School District
District wealth	District	District	District	District
Geographic locale	N/A	N/A	N/A	District
Accountability ranking	N/A	School District	School	School District

*Note.* Free and reduced-price lunch data in New Mexico were reported inconsistently from 1999–2003.

*Community Characteristics.* Education databases do not collect information about characteristics of the community within which a school and/or district is located. Census information provides a number of relevant indicators for community well-being, including family income, parent education levels, and receipt of public assistance.

### *Summary*

SEDL researchers found that existing state data can be used for education policy research on instructional resource allocation. Dollars spent to support instruction can be examined using fiscal data broken down by function, object, and program (in three of four study states) categories. These dollars also can be examined through staff databases that contain individual-level staff salaries. The added benefit of using individual staff salary data is the possibility of linking salaries to staff characteristics, such as years of experience, highest degree, and certification information. These staff characteristics, however, must be used with caution due to data quality concerns. Researchers should check staff years of experience data over multiple years to detect and correct errors. Also, since certification databases are managed separately from other staff characteristics, these data must be merged carefully with other staff data to avoid misaligned data. Certification data are also limited because data are continually updated in certification databases, and year-to-year snapshots of certified staff must be derived from certification issue dates (if available). Staff resources can be studied using state databases, and full-time equivalency (FTE) counts (head counts in Arkansas) on a wide range of staff categories are available in staff databases. These counts can be matched with staff demographic or other characteristics or calculated to create ratios such as pupil:teacher or teacher:administrator. Actual class size information, however, is reported only in Louisiana.

Student performance data and information on student, school, and district characteristics are essential for conducting research on resources and student performance. Student performance data in each of the states are unique and have undergone changes in years tested and/or the tests administered, creating difficulty for researchers to attempt regional comparisons or longitudinal analysis. Student performance scores are useful measures because they can be aligned to student characteristics and grade- or school-level resource data. Additionally, these data reflect measures that are familiar to state policy audiences. Student, school, and district characteristics are available in education databases in all four study states. These data are of reliable quality with few exceptions in some states and are of critical value in understanding the relative importance of student, school, and district environments on resources and student performance.

Policy questions of interest to the southwestern region and nationally can be answered using existing state education databases. By merging data on resources, student performance, and student, school, and district characteristics, researchers can answer policy questions such as the following:

- What are effective allocation patterns of instructional dollars in schools and districts with varying characteristics?
- Is teacher pay linked to teacher quality and student performance?
- What are the recommended distribution patterns of staff with differing characteristics?
- Should resources be invested to lower class size?

Although existing state education data offer great potential for informing policy through research, these data also pose opportunities for state policymakers to improve them for future research. Fiscal data could be improved by adding a measure for individual staff benefits in three states (Arkansas already collects these data) so researchers could consider the total compensation

package paid to teachers and other staff. States should collect information on professional development for teachers. Data on professional development spending would greatly increase researchers' ability to understand what investments in this area are effective. In order to better address priorities raised by the federal No Child Left Behind legislation, states could improve the scope and quality of teacher data. State policymakers and data managers should work to improve the reliability of staff experience data and the usability of teacher certification data. In order to better measure teacher quality, states should collect information about teacher degree major and professional development and should standardize data on teacher test scores. To understand the relationship between class size and student performance, researchers need more accurate estimates of actual class size that go beyond pupil:teacher ratios.

*Implications for Future Research.* Based on this study of existing state education data, we conclude that there is a need for increased attention on and use of these data for policy research purposes. Key features of the fiscal, staff, and student data we identified in this study helped frame SEDL's next resource allocation study. Student performance data are available in the form of criterion-referenced and norm-referenced test scores in all four study states, which provide outcome measures for a resource allocation study. This study also identified teacher salary data as a reliable and flexible subset of state financial data that all states collect at the individual level. Teacher characteristics collected in state databases are critical to understanding salaries and student performance. Several key measures of teacher qualification are available in all four of the study states, including years of experience, highest degree, degree institution, and certification. Finally, data on the socioeconomic environments where teaching and learning occur are collected by state education agencies in the form of student demographics and school and district characteristics. Based on this understanding of data available in existing state databases, we

propose to focus our next study on the question “What is the relationship between teacher salary levels and student achievement in high-need schools?” This study will make use of existing data and provide critical information to state and local policy audiences regarding the allocation of teacher resources.

## Chapter 4

### **Recommendations—What Can Education Policymakers, State Data Managers, and Researchers Do to Increase the Use and Quality of Existing State Education Data?**

State education databases are an important source of information that researchers and policy audiences should not overlook. Although state agency data-request procedures and the usability of some variables present challenges, the potential utility of applying these data to policy research questions is very high. Based on study findings, we recommend that policymakers, state data managers, and researchers work together to expand their use of state education data for resource allocation research. We also recommend that policymakers and state departments of education support and implement data improvements for greater applicability to informing state policy and find ways to make these data more available and accessible for research use.

#### *Expand the Use of State Education Data*

Our assessment of data use in the four study states clearly showed that data have not been used to their fullest potential to support policy decisions. Specifically, data use has been extremely limited to a few areas of interest such as school funding formulas, adequacy of education funding, and descriptive studies of finances and teachers. Policy studies that help decision makers understand the relationship between resources and student performance are rare in the four study states. Given what we learned from this study, policymakers and researchers need to work together to become more familiar with these data and to use them to inform decisions. Increased use of existing state education data not only would result in increased information for policymakers but also would fuel a feedback mechanism for states to better understand how data need to be improved or expanded to serve information needs.

### *Improve State Education Data for Policy Research*

Applying state education data to policy research purposes is a relatively recent priority that is not fully recognized by states even today. In order for the data needs of policy research to move to the forefront, state policy audiences, data managers, and researchers must provide input on how existing data could be improved and changed for research purposes—in addition to more traditional reporting and monitoring purposes. Policy audiences need to expand their use of existing data to inform their decisions by learning about what data exist and requesting that these data be used to answer critical policy questions.<sup>6</sup> Data managers can work to improve state data collection systems and increase the accessibility of data. Researchers can support policy audiences by conducting more research with existing state data and providing feedback to data managers regarding the quality and accessibility of these data. Although expanding the use of existing data for research purposes is an important goal, policymakers, data managers, and researchers also must be aware that state education data are collected for competing needs such as federal reporting, tracking state accountability goals, and supporting state funding formulas. When considering improvements and changes to state databases, we must balance the time and resource burdens that changes in state data systems create for schools, districts, and state agencies.

According to previous data assessment studies, policymakers, data managers, and researchers should consider several criteria to determine whether state data can be used to support their research and information needs regarding instructional resources, including the following:

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<sup>6</sup> Although this report highlights the usability of existing state education databases, policy researchers should continue to seek alternative sources of data and/or sponsor targeted collection of data if state sources are not sufficient.

1. Data must be available and accessible through a central source or through collaboration between agencies or departments that compile data related to instructional resource allocation. Data must be current and released to users in a timely manner.

2. Ideally, data systems would be automated, interconnected, and contain appropriate controls for confidentiality protection (Cohen, 1997). Privacy and confidentiality policies should be clear and consistent.

3. Data must be consistent, valid, and reliable, and reporting procedures should be enforced using such tools as standardized software programs.

4. Data systems must be user-friendly and supported by technicians who are well-trained and knowledgeable about data, hardware, and software. Users must have access to detailed data documentation.

5. Data systems must include data on all levels of the system (classroom, school, district, and state). Ideally, researchers should be able to disaggregate data to any level of organization.

6. Data systems must measure a wide range of instructional resources and costs, accurately gauge state performance expectations, and be able to relate instructional resource data to student performance and demographic information (Busch & Odden, 1997; Farland, 1997; Pane & Zwillinger, 2002).

It is clear from this study that education data across the four study states share similar structures and common variables. Federal reporting requirements linked to specific federal programs (Title I, Title II, special education programs, etc.) and national education data collection efforts (U.S. Census, National Center for Education Statistics, etc.) have helped to create similar data collection processes among states. As this study revealed, however, critical

differences in the variable definitions used by each state and the range of information they collect leave researchers with few avenues for pursuing cross-state or regional studies on education resources. Policymakers, data managers, and researchers should maintain a dialogue with national data centers such as the National Forum for Education Statistics that attempt to bridge the gap between the unique needs of state data systems and the research benefits of establishing national data standards.

We also recommend that policymakers and data managers consider the following targeted improvements to increase the usability of education data for resource allocation research:

1. Instructional expenditures at the school level are collected currently only in Texas; the other three study states collect this information at the district level. Adding school-level detail of how instructional resources are allocated would enable policy researchers to consider spending needs of schools in varying environments. This is especially important for those states with large or diverse school districts. If policy audiences are to understand how spending differences within districts affect the success of students in different schools, these data must be tracked and compiled in state education databases. However, when establishing new accounting mechanisms for schools and districts to use for reporting school-level expenditures, collection methods should be designed to avoid simple proration of district expenses across schools or inconsistency in coding expenditures across sites.

2. Teacher quality is quickly becoming one of the highest policy priorities due to the federal No Child Left Behind legislation and research results emphasizing the importance of good teachers as a predictor of student success. Policymakers and data managers need to ensure that data collected on teacher qualifications align with federal priorities. In all four study states,

state teacher databases lack information about a teacher's degree major. All four states also track teacher certification information on a cumulative basis, so snapshots in time of the existing teacher pool are difficult or impossible to obtain. We also recommend that data managers improve teacher certification data so that certifications can be aligned easily to teacher subject areas and grade levels. Teacher experience is a critical measure for policy decisions on teacher compensation, and data managers need to improve the accuracy of these data.

3. Class size limits are imposed by both federal and state policy, and the benefits of smaller class sizes have been the topic of intensive study over recent years. In order for state policy audiences to fully understand the influence of class size on student performance in diverse schools and districts, reliable data must be available. State education data in each of the four study states enable users to create different measures for class size. In three of the four states, students are not linked to their classroom teachers, so a true estimate of class size cannot be created. In New Mexico data do link students to teachers, but access to these data is restricted from outside users. If policymakers are to fully understand the relationship between class size and student success, accurate measures, including data that link individual teachers to specific students or classrooms, must be created for use in policy analysis.

4. Professional development is currently unaccounted for in state education databases in the four study states. Current research suggests that high-quality professional development for teachers affects the success of teachers (Charles A. Dana Center, 2002; Porter, Garet, Desimone, Yoon, & Birman, 2000). The No Child Left Behind legislation also has increased attention on the need for high-quality professional development for teachers, and states must account for the number of hours teachers spend in professional development. Additionally, without data on the amount and type of professional development for teachers and the cost of investments in

professional development to schools and districts, policymakers cannot consider the costs and benefits of statewide initiatives to provide professional development to educators.

### *Improve Accessibility of Data for Outside Users*

A number of factors influence the accessibility of state education data for use in policy research. If data are to be shared with outside users such as policy audiences and researchers, accessibility and availability are the critical first steps. We recommend policymakers and state education agencies consider the following issues

1. Interpretations of federal Family Educational Rights and Privacy Act (FERPA) regulations vary from state to state and change over time, affecting the accessibility of individual-level data. Individual-level data are necessary to conduct in-depth analysis of student subgroups and relationships between different types of students, teachers, and resources. Policymakers and data managers should ensure that FERPA regulations are interpreted in a consistent manner and should find ways for education agencies to share data from state databases while ensuring confidentiality of individuals.

2. Agencies that house state education data should ensure that procedures and staff are in place to assist data users. States vary in their ability to respond to requests from outside data users. Three of the four study states have limited staff who can pull data, address confidentiality concerns and scramble unique identifiers, and merge databases as needed to respond to data requests. In Texas, a standard process for responding to outside data requests has been instituted. However, in order to support the work that these requests generate, that state also charges a significant fee for special data requests, restricting accessibility to those who can afford these fees. State education agency staff are a critical resource to data users for data requests, information about data structures and variables, and coordination with the multiple departments

or related agencies that collect and manage education data. Clear procedures for data requests should be established, and state data managers should communicate the time and cost needed to provide data.

3. Departments at state education agencies that collect data should work toward creating centralized data systems that combine the multiple education databases within each state. State education data related to instructional resources are divided among multiple databases and are managed by different departments within state education agencies or other related agencies. Data users must navigate different database structures and different levels of documentation and staff time and expertise. Fiscal data generally are collected and compiled separately from staff and student data. Teacher certification data are collected and managed by a different agency in Texas and by distinct departments within the department of education in the other three study states. Decentralized data systems create difficulties in answering policy questions that align fiscal and staff resources with student performance. Efforts in Louisiana to compile all education data into a central system provide a model for aligning disparate data sources. The Louisiana Educational Accountability Data System (LEADS) is an ongoing effort to implement an integrated data management system to support Louisiana's education information needs. The Louisiana Department of Education is phasing in the Louisiana Educational Accountability Data System over time and already has integrated multiple data collection and dissemination systems (e.g., School Transcript System, School and District Accountability, the Data Warehouse, and Minimum Foundation Program Accountability). The costs and technical expertise required to complete this type of data integration are not yet available, nor are assessments of the relative benefits or utility to potential users. Additionally, the Texas Public Education Information Resource (TPEIR) database is being developed as a cross-agency data management system that

combines primary, secondary, and higher education information. This database is jointly managed by the Texas Education Agency, the Texas Higher Education Coordinating Board, and the State Board for Educator Certification, and integrates data collected through several different systems. We recommend that state education agencies and policymakers in all states investigate similar initiatives in order to expand access to state education data.

4. Improvements could be made so that data documentation is consistently available and comprehensive for all state education data. If researchers are to use data accurately, they need detailed documentation on what data variables are collected and computed by state education agencies. Information on variable definition, type, ranges (if applicable), and year-to-year changes should be made available. Agencies that manage education data should post updated documentation to agency Web sites to increase accessibility to this information.

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## Appendixes

Appendixes A–E are included as reference information for researchers and data users.

Appendix A provides a description of the methods used to conduct this study, including a description of the data quality criteria used to assess state data systems (see Table A3).

Appendices B–E describe in fine detail the data collected and housed by state education agencies in Arkansas, Louisiana, New Mexico, and Texas. Each state section describes relevant databases and discusses the data available to measure instructional expenditures; staff characteristics; student performance; and student, school, and district characteristics. For ease of use, each state section follows an identical structure and sequence of tables, as listed below:

Table X1	Summary of Existing State Databases
Table X2	Measure of Instructional Expenditures From District Financial Data
Table X3	Strengths and Challenges of Instructional Expenditure Data That Affect Their Use for Policy Research
Table X4	Staff Characteristics Available in State Databases
Table X5	Student and Staff Counts and Ratios
Table X6	Strengths and Challenges of Staff Data That Affect Their Use for Policy Research
Table X7	Student Performance Tests
Table X8	Strengths and Challenges of Student Performance Data That Affect Their Use for Policy Research
Table X9	Data Available in State Education Databases on Student Characteristics
Table X10	Data Sources for School and District Characteristics



## **Appendix A**

### **Methodology**

SEDL researchers examined existing state data to assess their usability for conducting research on fiscal and staff instructional resources; student performance; and student, school, and district characteristics. The five states in SEDL's region (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas) were prospective sites for the study. SEDL contacted the state departments of education in all five states to invite them to participate. Four of the five states agreed to participate; Oklahoma declined. In New Mexico, organizational changes at the New Mexico Public Education Department prevented a timely transfer of sample data for analysis. Due to the variability between state data, we conducted data analyses separately within each state. We also considered the state-specific policy concerns regarding the instructional resource allocation questions of interest to this study by consulting with state education agency officials in each state and assessing how state data have been used to inform policy in these states.

#### *Purpose of the Study and Research Question*

For this study, we addressed the question "Do state databases allow the investigation of the relationship between fiscal and staff instructional resources and student performance?" We examined state data in participating study states to discern whether these data supported new, rigorous research about resources and student performance. In order to assess the capacity of existing state data to conduct such research, we (a) identified the key variables within fiscal and staff instructional resources; student performance; and student, school, and district characteristics; (b) developed criteria to assess the usability of these data; and (c) applied these criteria to identify resource allocation questions that can be answered with state data. We also

examined whether commonalities exist in these data across the study states. Five major research activities guided this work, as described below and summarized in Table A1.

#### *Initial Data Identification and Examination*

We identified and examined data from state departments of education that measure instructional expenditures; staff characteristics; student performance; and student, school, and district characteristics. We focused attention on data available during a 4-year study period (1999–2003) and used public information sources such as online data descriptions and reports to determine what databases and types of measures were available in each study state. We communicated with state data managers through telephone, e-mail, and face-to-face visits to gain detailed descriptions of databases and definitions of relevant variables. Table A2 provides a list of fiscal, staff, and other measures we used to narrow the range of variables to investigate. We found that each state’s data varied with regard to the variables available, units of measure, and level of aggregation.

#### *Policy Research Needs on Resource Allocation*

We conducted an assessment of state data utilization in the four study states to determine the extent to which these data have been used to support resource allocation decision making (see chapter 2 of this report). We identified reports and research studies that used state data on education resources through Web searches, discussions with state policymakers, and searches of relevant databases, such as the Education Resources Information Center (ERIC). We also engaged state policy audiences in discussions at SEDL’s 2003 policy forum and in face-to-face discussions during data collection visits to identify specific policy concerns. Based on these activities and findings from our initial identification of relevant resource allocation variables in state databases, we identified a subset of policy questions to consider for this investigation.

Table A1

*Summary of Research Activities*

Activity	Description	Objective
1. Identify relevant existing databases and data variables of interest	Researchers reviewed public information sources about existing databases and relevant variables.	<ul style="list-style-type: none"> <li>Identify existing databases of interest for this study.</li> <li>Confirm that fiscal, staffing, performance, and demographic data are available in state databases.</li> </ul>
	Researchers conducted phone interviews and face-to-face visits with representatives of <ul style="list-style-type: none"> <li>state departments of education</li> <li>related state agencies (e.g., teacher certification)</li> </ul>	Collect initial information on relevant variables, including <ul style="list-style-type: none"> <li>description of variables (level of analysis, longitudinal data, etc.)</li> <li>definitions of variables (changes in longitudinal data, calculated variables, etc.)</li> <li>information about supplemental sources of data</li> <li>measurement of study variable not available in state data sets (e.g., estimating class size)</li> </ul>
2. Identify policy research questions about resource allocation	Researchers assessed how state data have been used to support resource allocation decisions.	<ul style="list-style-type: none"> <li>Identify policy issues that have already been addressed with the support of state data in each of the study states.</li> <li>Understand the need for additional policy analysis using state education data.</li> </ul>
	Researchers facilitated discussion at SEDL's policy forum with representatives from <ul style="list-style-type: none"> <li>state departments of education</li> <li>related state agencies (e.g., teacher certification)</li> <li>state legislature</li> <li>governor's office</li> </ul>	<ul style="list-style-type: none"> <li>Identify policy concerns related to instructional resource allocation in each study state.</li> <li>Establish whether instructional resource, student performance, and demographic data have already been analyzed by researchers or policy audiences.</li> <li>Discuss upcoming policy challenges and ways that state data could inform them.</li> </ul>
3. Assemble data and determine usability of data for policy research	Researchers applied established criteria to assembled data and analyzed data using descriptive statistics.	<ul style="list-style-type: none"> <li>Assemble data variables relevant to the resource allocation policy questions.</li> <li>Determine initial usability of data.</li> <li>Assess data for appropriateness for more sophisticated data analysis.</li> </ul>
4. Determine data capacity for supporting new rigorous instructional resource allocation research	Researchers considered the usability of data and research needs.	<ul style="list-style-type: none"> <li>Assess to what extent existing state data can be used to answer instructional resource allocation questions and what questions could be answered if data were improved.</li> </ul>

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5. Disseminate findings to policy audiences	Researchers are disseminating findings in written reports and discussions at meetings convened with policy audiences in each of the study states.	<ul style="list-style-type: none"><li>• Present findings and assessment of the type and scope of research that can be conducted to answer the instructional resource allocation questions.</li><li>• Get feedback on implications for state policy decision making.</li><li>• Raise awareness of how data can contribute to instructional resource allocation decisions.</li><li>• Discuss possible uses of information, including improving data management systems, prioritizing policy issues/areas related to instructional resources, and conducting new research on instructional resource allocation.</li></ul>
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Table A2

*Study Variables and Data Sources*

Major Variable Category	Variable Descriptions	Data Sources
Fiscal expenditures	<p>Operation expenditures for activities dealing with the interaction between teachers and students:</p> <ul style="list-style-type: none"> <li>• function, program, and object expenditures related to instruction, instructional staff support, and student support</li> <li>• payments from all funds for salaries, employee benefits, supplies, materials, and contractual services</li> </ul>	State departments of education data disaggregated to the lowest level of detail possible
Instructional resources	<p>Data variables related to teachers, aides, and administrators that include information:</p> <ul style="list-style-type: none"> <li>• reflected as head counts, full-time equivalency counts, and ratios (e.g., pupil:teacher, teacher:administrator)</li> <li>• about classroom assignment (e.g., subject area and grade level)</li> <li>• on teacher characteristics (e.g., teacher experience, certification, and education type/degree level)</li> </ul>	State departments of education and other supplemental state data disaggregated to the lowest level of detail possible
Student performance	<ul style="list-style-type: none"> <li>• Data from state achievement tests (norm- and criterion-referenced tests administered by state)</li> </ul>	State departments of education
Student, school, and district characteristics	<p>Exogenous characteristics that describe the students, schools, and districts:</p> <ul style="list-style-type: none"> <li>• student socioeconomic status</li> <li>• student race/ethnicity</li> <li>• school size</li> <li>• district size</li> <li>• district wealth</li> <li>• locale</li> <li>• family income</li> <li>• parental education</li> <li>• social services available</li> </ul>	State departments of education

### *Determine Usability of Data for Policy Research*

Once we identified data and refined and prioritized a list of variables for each state, we examined and determined their usability on a range of criteria (Table A3). The following three activities informed the data usability assessment:

1. We discussed databases with state data managers in order to gauge availability, accessibility, completeness, accuracy, consistency, and alignment.
2. We examined data elements, focusing on completeness, accuracy, consistency, and alignment.
3. We identified those data elements that were usable for further analysis and used descriptive statistics (frequencies, means, ranges, etc.) to gauge variability of data elements, show the level of disaggregation possible, determine if units of measure can be modified to fit specific analysis needs (e.g., staff full-time equivalency [FTE] counts vs. head counts), and discern whether missing data can be calculated or imputed. We also identified related variables that would align fiscal, staffing, performance, and demographic data.

We considered the results from our examination of education data in the study states to determine how they can be used to conduct new rigorous research about instructional resources, student performance, and demographic characteristics. For example, if instructional resources cannot be aligned with student performance data, researchers are limited in methods of answering the question of whether instructional inputs influence student achievement. We applied our knowledge about state data (e.g., variability of data points, levels of disaggregation, and availability of longitudinal data) to determine whether informative statistical approaches could be applied to these data (cohort analysis, longitudinal study, etc.). We also gained insights

about how state data can be improved to better address the goal of supporting instructional resource allocation research.

Table A3

*Data Usability Criteria*

Criterion	Indicators	Information Source
Availability and accessibility	Do sufficient data exist to measure instructional resources, student performance, and demographic characteristics at a useful level of analysis?	• Codebooks and/or visual examination of data points
	Do data reflect current (2002–2003) measures? Are data contained in accessible formats? Do state policies regarding confidentiality balance privacy concerns and need for access?	• Discussion with state data managers
	Are data complete? Do data measure all levels of the education system (classroom, school, district, and state)?	• Codebooks and/or visual examination of data points • Examination using descriptive statistics (frequency, ranges)
Completeness	Has completeness been maintained through standardized data collection procedures?	• Discussion with state data managers
	Do data accurately measure intended variables?	• Codebooks and/or visual examination of data points • Examination using descriptive statistics (frequency, ranges)
Accuracy	Has accuracy been maintained through data cleaning, editing, calculations, and storage?	• Discussion with state data managers
	Is consistency evident among student-, school-, and district-level data? Do data reflect uniform use of definitions? Are data consistent over time so that comparisons can be made longitudinally?	• Codebooks and/or visual examination of data points • Examination using descriptive statistics (frequency, ranges)
Consistency	Has consistency been maintained through uniform reporting procedures?	• Discussion with state data managers
	Are there common data elements that can link fiscal, staffing, performance, and demographic data systems? Do data identify each record unit by all standardized identifiers that apply to the unit (e.g., do school-level data elements contain the school name, state ID for the school, and district ID for the school)?	• Codebooks and/or visual examination of data points • Examination using descriptive statistics (frequency, ranges)
Alignment		

### *Dissemination of Study Findings*

These findings are of importance to state and local education decision makers, education researchers, and data managers in each of the study states. We will disseminate findings through written reports, summary policy papers, and meetings with targeted audiences in the four study states.

### *Limitations of this Study*

A number of limitations impacted this study. Resource, performance, and demographic data are collected by school districts and managed by state data managers. We could not fully account for the validity and reliability of these data from diverse district-level recording methods and other sources of data such as teacher certification applications and test scoring entities. States continually make changes and additions to their data systems; consequently, a point-in-time assessment of data capacity is useful for only a short time, after which updates are required. Finally, the time and capacity of data managers and other staff to assist data users varied widely from state to state. State education agency procedures for responding to data requests varied widely, ranging from formal procedures to informal practices to lack of capacity to provide data.

## **Appendix B**

### **Arkansas State Education Data**

The Arkansas Department of Education is the primary source of education data for the state. The department oversees the provision of education services in over 1,100 schools organized into 310 districts.<sup>7</sup> Information is collected on financial activity in each school district, on the characteristics of more than 33,000 teachers, and on the performance and demographics of over 400,000 students per year. Data collection and management have undergone restructuring in the recent past with improvements made to data accessibility, collection, and reporting.

#### *Overview of Existing State Data*

Three major databases are relevant for policy research studies focusing on instructional resources and student performance. Financial, staff, and student data are collected through the Arkansas Statewide Information System (SIS); staff certification information is compiled in the Arkansas Professional Licensure System (APLS); and student performance data are managed by the Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) (see Table AR1).

The Arkansas Statewide Information System (SIS) was implemented by the Arkansas Department of Education to manage data collection and reporting activities for school districts in the state. The Arkansas Statewide Information System is the data collection vehicle for financial, staff, and student information, and it also provides a computerized interface for schools and districts to access their data. This system resulted from legislation requiring a reduction in the amount of paper used for data reporting and the need for accurate and timely information for

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<sup>7</sup> Recent consolidation reduced the number of districts to 308 in 2003–2004 and to 254 in 2004–2005.

policymakers and school systems. Currently, the Arkansas Statewide Information System is managed by the Arkansas Public School Computer Network (APSCN) at the Arkansas Department of Education. Of interest to this study are the following Arkansas Statewide Information System data elements related to district finances and staff and student information:

1. Financial data are collected and reported by districts through the Arkansas Statewide Information System. Districts enter data into the system using variable categories aligned with the U.S. Census reporting system (F-33 form), including revenues by source and expenditures by function and object as listed in the Financial Analysis and Accountability Report (FAAR) template, which is located on the Arkansas Public School Computer Network (APSCN) Web site (<http://www.k12.ar.us/apscndocs/finrptcard.pdf>). Financial Analysis and Accountability Reports are generated for each district separately and can be downloaded as portable document format (.pdf) files at [http://www.as-is.org/search/list\\_reports.html](http://www.as-is.org/search/list_reports.html). The Public School Finance and Administration Unit at the Arkansas Department of Education provides technical assistance to school districts regarding financial reporting procedures and standards and maintains the *Arkansas School and Educational Service Cooperative Financial Accounting Manual*.

2. The Arkansas Statewide Information System is also the statewide student and staff information system for K–12 public education in Arkansas. School districts are asked to collect and submit detailed student and staff information for inclusion in the Arkansas Statewide Information System database. Data are collected on all public school students and on all certified and classified staff. Districts are required to submit student data on six of seven reporting periods starting on September 15 (Cycle 1) and ending on June 7 (Cycle 7). Staff data are reported on the second reporting period and financial data are reported on the first reporting period. School-level staff and student information can be accessed through a file transfer protocol site,

<ftp://165.29.215.34/>. All data are in Microsoft Access format. Arkansas Statewide Information System database variables are listed and defined in two handbooks, *Statewide Information System* and *Reporting and Statistical Database Schema*, which are updated annually by the Arkansas Department of Education and available by request.

The Professional Certification/Licensure Unit at the Arkansas Department of Education maintains the Arkansas Professional Licensure System (APLS), a database that contains certification information about each individual teacher and administrator in the state. Information in this database is collected from applications for licensure, teacher test results, and certifications granted to applicants. Documentation of the Arkansas Professional Licensure System data is limited and is available by request from the Professional Certification/Licensure Unit. Data on teacher and administrator licensure can be requested from the Professional Certification/Licensure Unit. A limited amount of these data are transferred to the Arkansas Statewide Information System and may be accessed in aggregated reports through a file transfer protocol site (<ftp://165.29.215.34/Certification/>) maintained by the Information and Technology Unit at the Arkansas Department of Education.

The Arkansas Department of Education Accountability Unit under the Arkansas Comprehensive Testing, Assessment, and Accountability Program oversees the state's student achievement testing (<http://arkedu.state.ar.us/actaap/index.htm>). The state administers multiple student achievement tests, including the Stanford Achievement Test<sup>8</sup> norm-referenced exam, a criterion-referenced state benchmark exam, and end-of-course exams. Data are collected and compiled on all of these tests for all students that take the exam(s). School, district, and state performance data are publicly accessible through electronic report cards on the Arkansas School

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<sup>8</sup> The state norm-referenced test changed to the Iowa Test of Basic Skills in 2004.

Information Site (AS-IS), <http://www.as-is.org/>. The National Office of Rural Measurement and Evaluation Systems at the University of Arkansas, Fayetteville supports the management of student achievement test data through contract with the Arkansas Department of Education. This university department also provides reports and summaries of student performance data on their Web site (<http://normes.uark.edu/>).

Table AR1

*Summary of Existing State Databases, Arkansas*

Data Category	State Database	Managing Agency/Department
Instructional expenditures	Arkansas Statewide Information System (SIS)	Public School Finance and Administration Unit, Arkansas Department of Education
Staff characteristics	Arkansas Statewide Information System (SIS)	Arkansas Public School Computer Network (APSCN), Arkansas Department of Education
Student characteristics	Arkansas Statewide Information System (SIS)	Arkansas Public School Computer Network (APSCN), Arkansas Department of Education
Student performance	Student achievement data	Accountability Unit, Arkansas Department of Education
Teacher licensure	Arkansas Professional Licensure System (APLS)	Professional Certification/Licensure Unit, Arkansas Department of Education

*Instructional Spending*

Dollars spent for instructional purposes by school districts in Arkansas can be measured through two data sources. First, researchers can obtain financial data for each school district on spending in specific instructional areas. Second, researchers can request salary information on individual instructional staff members. These data sources are summarized in Table AR2 and described below.

Table AR2

*Measures of Instructional Expenditures From District Financial Data, Arkansas*

Fiscal Measure	Variables Available	Description	Unit of Analysis
Instruction-related expenditure functions	Instruction	Activities dealing directly with the interaction between teachers and students. Includes a breakdown of spending by program activity.	District
	Support services—students	Activities designed to assess and improve the well-being of students and to supplement the teaching process. Includes a breakdown of spending by service.	District
	Support services—instructional staff	Activities associated with assisting the instructional staff with the learning process.	District
	Support services—general administration	Activities concerned with establishing and administering district policy. Includes a breakdown of spending by administrative entity.	District
	Support services—school administration	Activities concerned with the administrative functions of a school. Includes spending for the office of the principal and other services.	District
Expenditure objects	Personal services—salaries	Compensation paid to permanent and temporary district employees, including substitutes.	District
	Personal services—employee benefits	Costs paid on behalf of employees that are not part of an employee's gross salary.	District
	Purchased professional and technical services	Services performed by persons with specific expertise in a specialized field.	District
	Purchased property services	Services purchased to operate, repair, maintain, and rent property owned or used by the district.	District
	Other purchased services	Contracted services not classified in other object categories.	District
	Supplies and materials	Expenditures for supplies and materials.	District
	Property	Expenditures for the acquisition of land, buildings, improvements, initial equipment, and replacement equipment.	District
	Other objects	Amounts paid for good and services not otherwise classified.	District

Staff salary data <sup>a</sup>	Salary	The contract amount paid to the employee.	Individual certified/ classified staff
	Source of salary	Fund code from which salary is paid <ul style="list-style-type: none"> <li>• Teacher salary</li> <li>• Operating</li> <li>• Building</li> <li>• Federal</li> <li>• Activity</li> <li>• Food Service</li> </ul>	Individual certified/ classified staff
	Benefits	The cost of employee benefits.	Individual certified/ classified staff

<sup>a</sup>Beginning in 2002–2003, salary information was linked to function and object financial categories and partial salary amounts were reported for specific program areas under which a teacher worked.

*Instructional Expenditures.* The financial reporting system in Arkansas uses two function categories pertaining to instructional expenditures: instruction and support services. The instruction function encompasses spending on activities dealing directly with teaching students and teacher–pupil interaction. This function is divided into six subfunctions composed of specific program areas: regular programs, special education programs, workforce education programs, adult/continuing education programs, compensatory education programs, and other instructional programs (such as music, English as a second language, and gifted and talented programs).

The support services function includes expenditures for services that provide administrative, technical, and logistical support to facilitate and enhance instruction and community services. The support services function is divided into four important subfunctions: (a) student, (b) instructional staff, (c) general administration, and (d) school administration. Neither the support services function nor the four subfunctions are divided into program categories as is done with the instruction function. The four subfunctions are defined as follows:

1. Student support services are defined as activities designed to assess and improve the welfare of students and supplement the teaching process. The student support services

subfunction is further divided into activity categories: student attendance, social work services, guidance services, counseling, health services, psychological services, speech pathology and audiology services, and physical and occupational therapy.

2. Instructional staff support services include activities associated with assisting the instructional staff with the learning process. This subfunction is further divided into curriculum supervision, educational media services, and other support services.

3. General administration support services, although not directly related to instruction, provide important data for comparative purposes for policy analysis. This subfunction is divided into expenditures for different administrative entities, including district board of education, office of the superintendent, and other administrative offices.

4. The school administration support services subfunction includes spending on activities concerned with the administrative functions of the school, including the office of the principal.

Object-level expenditures further describe the service or commodity obtained as a result of a specific expenditure. Eight object-level categories containing multiple subobject categories are used for financial reporting (see Table AR2). For example, the object-level category “personal services—salaries” is used for compensation paid to permanent and temporary employees of the district and also includes dollars spent for overtime, sabbatical, workshops, substitutes, and other expenses. “Personal services—employee benefits” includes costs paid on behalf of employees that are not included in the salary object. Expenditures on the district’s share of group insurance costs, teacher retirement contributions, tuition reimbursement, and other standard benefit categories (Medicare, Social Security, workers’ compensation, etc.) are included in this category. The remaining object-level expenditure categories are listed in Table AR2.

*Individual Staff Salary Data.* Aggregated expenditures on employee salaries and benefits are available using object-level categories in the financial data as described above. In addition, individual-level salary and benefits information for certified and classified staff are collected through the Arkansas Statewide Information System. Each staff record contains a total salary amount, an amount spent on benefits, and the source of revenue that funded the salary. As of 2002–2003, these data were also linked to function and object financial categories. Also beginning 2002–2003 data were organized so that partial salary information could be obtained based on the specific program area(s) in which the teacher provided services.

*Data Usability.* Researchers considered data on instructional spending from both the financial database and the Statewide Information System for their potential usefulness for policy research purposes (see Table AR3). Overall, the district-level data on instructional expenditures and the individual-level staff salary data are useful for conducting resource allocation research. The two sources of expenditure data provide both a district-level perspective of overall spending in instructional areas and individual-level information about salaries and benefits that could be aggregated for specific types of staff (e.g., teachers) and to the school or district. District expenditure data are easily accessed through the Arkansas Department of Education Web site, which provides reports in portable document format (.pdf) about each school district's spending for instructional function and objects. Documentation is contained in the Arkansas Financial Accounting Manual, available by request from the Arkansas Department of Education, and in the Arkansas Statewide Information System handbooks that are updated annually. District financial expenditure data have been collected using consistent variable categories over the study period, and function and object categories match those reported to the U.S. Census. This consistency supports the completeness of these data as well as accuracy because districts are familiar with

state reporting formats. Staff salary information is collected for all staff, whether certified or classified. The Arkansas Statewide Information System was implemented with the goal of further standardizing and increasing the accuracy of the collection of staff data. The structure of the Arkansas Statewide Information System also allows easy alignment of staff salary information with staff characteristics, job assignment, and location. The alignment of these data allows users to average salary expenditures across staff roles, programs, schools, and districts.

Data that measure instructional expenditures in Arkansas are not without challenges. Access to individual-level data from the Statewide Information System is limited to requests from the Arkansas Department of Education, whose staff have limited time and few standard procedures for providing data to outside users. Individual staff data are organized using staff Social Security numbers as a unique identifier, making confidentiality of these data an obstacle to data requests. Also hampering the availability of these data are the multiple departments within the Arkansas Department of Education that oversee data collection and compilation. Arkansas Statewide Information System data are primarily managed by the Information and Technology Unit; however, portions are maintained by the Arkansas Public School Computer Network, which previously was a different entity from the Arkansas Department of Education and is now under the purview of that department. Oversight for financial data collected by the Arkansas Statewide Information System is conducted by the Public School Finance and Administration Unit at the Arkansas Department of Education. Potential data users must understand the complexity of these relationships if data are to be accessed effectively. For example, data on individual staff benefits are collected from districts but are not reported in Arkansas Statewide Information System documentation. Therefore, in the case of this study, discussions with staff at the Arkansas Public School Computer Network were necessary to

understand these data. One important change in the collection of staff salary data had implications for the accuracy and consistency of these data. Beginning in 2002–2003, the state began collecting additional staff information on the portion of a staff’s salary paid for work in specific program areas (partial salary variable). The state also redefined the total salary variable to measure the actual rather than contracted salary amount. Individual salary information was also linked to function and object expenditure codes from the financial data system. Although these changes created greater flexibility of use for these data and more refined and valid measures of individual salaries, these data were also problematic, as districts seem to be adjusting to new collection formats.

Table AR3

*Strengths and Challenges of Instructional Expenditure Data That Affect Their Use for Policy Research, Arkansas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Data are available from two sources: district-level financial data and individual-level spending on staff salaries and benefits.</li> <li>Financial data reports are posted on the Arkansas Department of Education Web site and can be requested from that agency.</li> <li>Data documentation is available by request; some is posted to the Arkansas Department of Education Web site.</li> </ul>	<ul style="list-style-type: none"> <li>Individual staff salary data are only available by request and must be stripped of identification number (SSN).</li> <li>Oversight for different databases is divided among different units within the Arkansas Department of Education.</li> <li>Not all available fiscal data are reported in Arkansas Statewide Information System documentation.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>District financial data are available for all districts and all years of the study period.</li> <li>Staff salary data are collected for all certified and classified staff.</li> </ul>	
Accuracy	<ul style="list-style-type: none"> <li>The consistency of the financial data structure supports greater accuracy of data collection from school districts.</li> <li>The development of the Arkansas Statewide Information System has increased attention on accuracy and standard procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in reporting for individual staff salaries have not been fully integrated by district reporting.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>Financial function and object categories are aligned to federal reporting categories and have not changed during the study period.</li> </ul>	<ul style="list-style-type: none"> <li>Individual-level staff salary data changed in 2002–2003 so that partial salaries based on program codes could be determined. These data also were linked to financial function and object expenditure categories, making the total salary an actual rather than contracted amount.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>Individual staff salary data can be aligned with other staff characteristics.</li> <li>Staff salary data can be averaged across staff roles, schools, and districts.</li> </ul>	<ul style="list-style-type: none"> <li>Financial data and individual staff salary data have been recently aligned with function and object codes, and the accuracy of this alignment is not certain.</li> </ul>

*Staff Characteristics*

Information about staff characteristics is collected at the individual level in the Arkansas Statewide Information System. These data are collected at the October 15 reporting period each

school year. Demographic characteristics, qualifications, job assignment, and salaries (see previous discussion) are collected for all certified and classified staff positions. Additionally, the Professional Certification/Licensure Unit at the Arkansas Department of Education collects individual-level certification information on teachers and administrators (see Table AR4).

Table AR4

*Staff Characteristics Available in State Databases, Arkansas*

Staff Characteristic	Variables Available	Unit of Analysis	Source
Job code	Each job assignment performed by a staff person (multiple assignments per individual possible)	Individual	Arkansas Statewide Information System
Location	School and district to which the staff person is assigned	Individual	Arkansas Statewide Information System
Experience (classified staff)	Total years of experience in and out of state	Individual	Arkansas Statewide Information System
	Years experience in current district	Individual	Arkansas Statewide Information System
	Date hired by district	Individual	Arkansas Statewide Information System
Education (teachers)	Lowest degree earned	Individual	Arkansas Professional Licensure System
	Lowest degree institution	Individual	Arkansas Professional Licensure System
	Highest degree earned	Individual	Arkansas Professional Licensure System
	Highest degree institution	Individual	Arkansas Professional Licensure System
	Professional development hours	Individual	Arkansas Statewide Information System
Demographics	Gender	Individual	Arkansas Statewide Information System
	Race/ethnicity	Individual	Arkansas Statewide Information System
	Birth date	Individual	Arkansas Statewide Information System

Certification (teachers)	Subject area of license	Individual	Arkansas Professional Licensure System
	Grade level (lowest and highest grade) of license	Individual	Arkansas Professional Licensure System
	Application type	Individual	Arkansas Professional Licensure System
	Licensure effective date	Individual	Arkansas Professional Licensure System
	Licensure expiration date	Individual	Arkansas Professional Licensure System
	Non-traditional licensure	Individual	Arkansas Professional Licensure System
	National board certification	Individual	Arkansas Professional Licensure System
Grade	Lowest grade level taught for each job assigned	Individual	Arkansas Statewide Information System
	Highest grade level taught for each job assigned	Individual	Arkansas Statewide Information System

*Counts and Ratios.* Staff counts and ratios can be calculated from individual data in the Arkansas Statewide Information System database (see Table AR5). Head counts can be created for staff and grouped by job codes, schools, districts, qualifications, or demographic characteristics. Full-time equivalency (FTE) counts are not available in Arkansas staff data; although a variable exists for this information in the staff database, these data are not complete. Researchers can calculate a pupil:teacher ratio using student enrollment information and an aggregate of the classroom teachers listed in the Arkansas Statewide Information System. State databases do not contain actual class size information. Staff ratios such as teacher:administrator or pupil:administrator can also be calculated using aggregated head counts from the Arkansas Statewide Information System data.

Table AR5

*Student and Staff Counts and Ratios, Arkansas*

Count/Ratio Measure	Data Available	Unit of Analysis	Source
Head counts of staff in specific roles (teacher, principal, etc.) and with specific characteristics (see Table AR4)	Can be calculated from existing data	Job code School District Demographic subgroups	Arkansas Statewide Information System
Class size	N/A	N/A	N/A
Other ratios: • pupil:teacher • pupil:administrator • teacher:administrator	Can be calculated from existing data	School District	Arkansas Statewide Information System

*Data Usability.* As summarized in Table AR6, data on staff characteristics are useful in many ways for policy research purposes but also contain some limitations for these purposes. These data are collected on an individual level, creating flexibility for researchers to create aggregated data on a number of categories, such as school, district, and demographic characteristics, and to create student and staff ratios for schools and districts. Information on those staff with the job code of classroom teacher, for example, can be isolated for research purposes. The most important data usability challenge concerns accessibility of staff data for use by outside researchers. As presented in the discussion of staff salary data, state, district, and school summaries of staff information are available on the Arkansas Department of Education Web site, but individual-level data must be requested directly from the Arkansas Department of Education. Arkansas Department of Education data managers have limited time to respond to these requests, and few established procedures for providing raw data for outside users exist. Also, since the unique identifier for staff in the Arkansas Statewide Information System database is the individual's Social Security number, data must be merged with other data if necessary and then stripped of identifiers before they can be sent to outside users. Another concern regarding

data usability is that teacher certification data are compiled from a different source and using different procedures than the Arkansas Statewide Information System. Data on the same individuals originate from two streams of data collection using different procedures, creating greater possibility of misaligned data on teachers. Additionally, licensure data are collected using a cumulative process in which updates are made to teacher information without annual archives. Researchers must rely on the certification issue date and expiration date of each staff in order to create a subset of active, certified staff for a given study period. Data managers at the Arkansas Department of Education explained that some teacher certification variables are unreliable. Years of experience data suffer from unreliable data collection practices, and data on national board certification are highly suspect for errors. Finally, although head counts of staff can be calculated, full-time equivalency (FTE) counts of specific staff categories cannot be calculated with existing data. A variable for full-time equivalency (FTE) count for certified staff does exist; however, the data are incomplete and cannot be used to estimate staff counts.

Table AR6

*Strengths and Challenges of Staff Data That Affect Their Use for Policy Research, Arkansas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Individual-level staff characteristics are collected with ability to aggregate data up to school or district levels.</li> <li>Data documentation for the Arkansas Statewide Information System is updated annually.</li> </ul>	<ul style="list-style-type: none"> <li>Individual-level staff data are not publicly available and must be obtained by special request from the Arkansas Department of Education staff, who must strip or scramble the unique identifier (Social Security number).</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>Staff data are collected for certified and classified staff for all schools and all years of the study period.</li> </ul>	<ul style="list-style-type: none"> <li>Full-time equivalency (FTE) counts of staff categories cannot be determined due to incomplete data.</li> </ul>
Accuracy		<ul style="list-style-type: none"> <li>Accuracy of certain variables of interest is suspect (e.g., years of experience and national board certification).</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>Data collection documentation provides clear instructions with helpful examples for the user.</li> </ul>	
Alignment	<ul style="list-style-type: none"> <li>Staff characteristics can be linked to salary data and licensure data.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher data are a combination of two data collection efforts: staff characteristics and teacher certification.</li> <li>The cumulative process used to keep the licensure database updated creates the potential for misaligned data.</li> </ul>

*Student Performance*

The state of Arkansas uses multiple tests for measuring student performance: norm-referenced tests, criterion-referenced tests, and end-of-course exams (see Table AR7). Student performance is gauged at the school and district level and is the basis for the school report cards.

*Norm-Referenced Tests.* Arkansas has traditionally relied on norm-referenced student achievement tests to track performance of students. The Stanford Achievement Test (SAT), 9th edition, has been in place since 1996 for grades 5, 7, and 10. The state reports percentiles for the complete battery and disaggregated data for math, reading, language arts, and other subject areas.

*Criterion-Referenced Tests.* Based on 1999 state legislation, the criterion-referenced state benchmark tests were introduced gradually for grades 4, 6, and 8 in reading, writing, and math. Since 2001–2002 all three grade levels have been tested. Data are reported in scale and raw scores.

*End-of-Course Exams.* End-of-course exams in algebra, geometry, and literacy are administered after course completion. There is no high school exit exam currently in place in Arkansas.

*State Accountability Ranking.* Arkansas currently does not rank all of its schools and districts for accountability purposes. The state does, however, identify those schools that are in academic distress based on district performance on standardized tests, dropout and attendance rates, teacher quality, professional development hours, and school safety. Three levels of academic distress are used (Phases 1, 2, and 3). Also, performance categories are used to rank students based on their student achievement scores (advanced, proficient, basic, below basic), and these ranks are aggregated to the school and district level.

Table AR7

*Student Performance Tests, Arkansas*

Test	Type	Scoring	Grades	Subject Areas	Notes
State Benchmark tests	Criterion-referenced	Scale score, raw score	4, 6, 8	Math, reading, writing	Fourth grade was added in 1999, eighth grade in 2000, and sixth grade in 2001
Stanford Achievement Test, 9th edition	Norm-referenced	Percentile rank	5, 7, 10	Complete battery: reading, math, language, social science, listening, using useful information, etc.	Switched from fall to spring testing in 2002–2003
End-of-course exam	End-of-course		At course completion	Algebra, geometry, literacy	No exit exam is used in Arkansas.

*Data Usability Issues.* Norm-referenced student testing in Arkansas has stayed relatively consistent over time and has included multiple grades (5, 7, and 10) for all the years considered in this study (1999–2003). The criterion-referenced benchmark tests, however, have been introduced step by step between 1999 and 2001. These data allow researchers to track the performance of an individual student from year to year. However, a growth score can only be calculated for every other year. The content of the criterion-referenced tests has also been modified over time. This means that longitudinal analysis of performance of student cohort groups can only be performed in a limited way. These data are fairly accessible for researchers in aggregate reports. State-, district-, and school-level summaries of student performance are published on the Arkansas School Information Site. Individual-level student data, however, are not publicly available and must be obtained through special request from the Arkansas Department of Education.

Table AR8

*Strengths and Challenges of Student Performance Data That Affect Their Use for Policy Research, Arkansas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>School- and district-level performance data (percentage of students at four proficiency levels) are posted on the Arkansas Department of Education Web site.</li> </ul>	<ul style="list-style-type: none"> <li>Student level data and disaggregated score formats (raw score, scale score) must be obtained by special request from the Arkansas Department of Education.</li> <li>School and district performance data cannot be downloaded in a single file from the Arkansas Department of Education Web site.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>Student performance data can be requested from the Arkansas Department of Education on all test takers and also on subgroups (high-poverty, high-minority, special education, limited English proficient).</li> </ul>	<ul style="list-style-type: none"> <li>Test scores are available for a limited number of years (grades 4, 6, and 8 for the state benchmark test; grades 5, 7, and 10 for the Stanford Achievement Test).</li> </ul>
Accuracy		<ul style="list-style-type: none"> <li>Data available on the Arkansas Department of Education Web site are limited to percentage of students at four proficiency levels, limiting the full range of variability in test results for research purposes.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>Stanford Achievement Test results provide a consistent span of test years and grades tested.</li> </ul>	<ul style="list-style-type: none"> <li>State benchmark tests were added between 1999 and 2001 (grade 4 in 1999, grade 8 in 2000, grade 6 in 2001); test content also was modified during these years.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>Demographic and programmatic information about test takers can be matched with test results.</li> </ul>	<ul style="list-style-type: none"> <li>Recent addition of grades 6 and 8 state benchmark exams limit longitudinal comparisons.</li> </ul>

*Student, School, and District Characteristics*

*Student Characteristics.* Arkansas school districts compile information on individual students and report these data to the Arkansas Statewide Information System. Most student data are reported on six of the seven state reporting periods, starting October 15. The student characteristics that are contained in the Arkansas Statewide Information System and of interest for this study are listed in Table AR9.

Table AR9

*Data Available in State Education Databases on Student Characteristics, Arkansas*

Student Characteristic	Variables Available	Source	Unit of Analysis
Socioeconomic status	Free and reduced-price lunch program participation	Arkansas Statewide Information System	Individual
Race/ethnicity	Ethnicity	Arkansas Statewide Information System	Individual
Grade	Grade	Arkansas Statewide Information System	Individual
Gender	Gender	Arkansas Statewide Information System	Individual
Program participation	<ul style="list-style-type: none"> <li>• Special education</li> <li>• Limited English proficient (LEP)</li> <li>• Migrant</li> <li>• Mobile</li> <li>• Title I</li> </ul>	Arkansas Statewide Information System	Individual

*School and District Characteristics.* Student characteristics can be aggregated to the school and district levels, creating important demographic characteristics. The characteristics of interest to policy researchers are listed in Table AR10 with the sources of data for each characteristic. Overall, most important characteristics can be viewed and exported from data in the Statewide Information System. Characteristics that are measured only at the district level include district wealth, which is measured as the sum of residential and nonresidential property assessment in the district, and the district tax rate, which is the amount of revenues available from local taxes (including residential and nonresidential).

Table AR10

*Data Sources for School and District Characteristics, Arkansas*

Characteristic	Data Sources	
	School	District
School type	Arkansas Statewide Information System	N/A
School/district size	Arkansas Statewide Information System	
School level	Arkansas Statewide Information System	N/A
Locale	U.S. Census Bureau 2000 Census	
Attendance rate	Arkansas Statewide Information System	
Dropout rate	Arkansas Statewide Information System	
Per pupil expenditures	N/A	Calculation of expenditure and enrollment data
Average class size	N/A (pupil:teacher ratio can be calculated)	
Number of teachers	Arkansas Statewide Information System	
District wealth	N/A	Arkansas Statewide Information System

*Community Characteristics.* Education databases do not contain information about characteristics of the community within which a school and/or district is located. Census information provides a number of relevant indicators for community well-being, including family income, parent education levels, and receipt of public assistance.

*Summary of Findings*

Arkansas state education data allow investigation of instructional resources and student performance. Instructional spending measures include both district-level fiscal expenditures that can be broken down to subfunction and object-level spending and to individual-level spending on staff salaries and benefits. Staff data also include demographic characteristics and qualifications such as years of experience and highest degree. Staff data also are coded with identifiers that allow researchers to create subgroups of teachers, administrators, and other distinct staff categories. The Arkansas Professional Licensure System collects additional data on certified staff, including certification information. These monetary and staff measures can be

aligned with student performance data. Student performance data include scores from criterion-referenced and norm-referenced exams. Including student, school, and district characteristics that are collected and housed by state education databases can enhance research using these data.

*Alignment.* One feature of state education data in Arkansas is the way in which these data are divided so that management of different types of data is conducted by various departments within the Arkansas Department of Education. Researchers would need to depend heavily on their ability to find mutual identifiers that can bridge the data between two or more databases. Alternatively, researchers could work closely with staff at the Arkansas Department of Education who are knowledgeable of the data and could merge the data on the variables of interest. Also related to the division of education data among different departments in the Arkansas Department of Education is the way in which teacher certification data are collected and managed. The Professional Licensure Unit collects and maintains certification data that can be aligned with staff data from the Arkansas Statewide Information System using a matching unique identifier (Social Security number). However, the licensure database is updated continuously, without year-to-year archives, so it is much more difficult to align existing staff with their certification status. Researchers must rely on accurate issue dates and expiration dates of certifications in order to construct the certification information for a given staff person in a given year.

Of greatest concern for researchers regarding the alignment of these data is that financial, staff, and student performance data have been improved and therefore changed in the 5-year study period. Financial categories are now attached to individual staff salaries. Beginning in 2002–2003 staff data were restructured so that individual staff roles were identified and recorded, and partial salary information was collected based on the percentage of effort that staff

dedicated to different positions. Regarding student performance data, the criterion-referenced exam was phased in over a number of years, limiting researchers' ability to measure longitudinal performance on this exam.

*Accessibility.* Data access has increased during the study period, and the Arkansas Department of Education has developed interactive Web reporting of school data, a file transfer protocol (FTP) site that can be used to download school-level staff and student data, and online financial reports for all school districts. Arkansas Department of Education staff can respond to requests for data by outside users. However, the agency lacks staff dedicated to the role of supporting outside data users. Although data managers and staff are responsive to outside data requests, these requests must be filled in addition to the regular workload of agency staff and often take time and periodic reminders by the requesting party.

*Usability.* Instructional spending data collected and organized in Arkansas education databases are useful for policy research. Financial expenditures are organized into categories that match those used by federal fiscal data reports (Common Core of Data). These data also are divided into more refined categories than available at the federal level. For the category of instruction, for example, spending can be determined for a range of program areas (regular education, special education, etc.). Individual staff salary data are linked to fiscal function categories and also provide a measure for employee benefits. Other individual staff data are collected in state education databases. These data can be used to identify individuals with different staff positions, and a range of demographic and other characteristics can be attributed to these individuals. Information about individuals with multiple positions is also collected; these data can be linked to partial salary amounts as well.

Challenges also exist for researchers using data on resources and student performance. Improvements in the data collection of staff salaries and characteristics in 2002 created the likelihood that districts did not report their information consistently. Data managers identified a few variables related to this change for which districts are not yet reporting accurate data (staff full-time equivalency, years of experience). Although staff years of experience data contain errors, these data can be used for research purposes; data users may choose to compare multiple years of these data to identify and correct obvious errors. The full-time equivalency of staff position variable is not usable for research purposes because most of this information is incomplete. The completeness and validity of these data may improve over time as districts become more familiar with changes in the reporting system. Also, state education databases currently do not collect information on class size. An estimate of the pupil:teacher ratio can be calculated using teacher head counts and student enrollment. However, this calculation cannot account for variations in classroom structure, teachers teaching multiple classes, teachers that do not work in the classroom, and other sources of miscalculating an accurate pupil:teacher ratio.

## Appendix C

### Louisiana State Education Data

The Louisiana Department of Education (LDE) is the main source of education data for the state of Louisiana. The state has 64 parish school districts and four city school districts, employs 60,045 certified staff, including 50,082 classroom teachers, and serves a total of 734,706 children in the public school system (as of October 1, 2003).

#### *Overview of Existing State Data*

Researchers examined six education databases housed by the Louisiana Department of Education. Four are maintained by the Division of Planning, Analysis, and Information Resources (PAIR), one is maintained by the Division of Student Standards and Assessment, and the last is maintained by the Division of Teacher Certification and Higher Education. These six databases provide information regarding instructional spending, staff characteristics, teacher certification, student performance, and student characteristics (see Table LA1).

The Division of Planning, Analysis, and Information Resources collects and maintains data for four databases relevant to this study. This division maintains a central Web site where data and reports are available to the public (<http://www.doe.state.la.us/lde/pair/1419.html>). The Web site for Data Collection Systems (<http://www.doe.state.la.us/lde/pair/638.html>) includes user's manuals that define all data elements and posts timelines of data submissions. The four Planning, Analysis, and Information Resources databases are described below.

1. School districts in Louisiana report district-level financial data to the state via the Annual Financial Report (AFR). Data are submitted every fall for the previous school year. Similar to Arkansas financial data, fiscal categories match those collected by the U.S. Census Bureau on the F-33 form (including revenues by source and expenditures by object, function, and

program). The *Louisiana Accounting and Uniform Governmental Handbook*, available on the Planning, Analysis, and Information Resources Web site, describes each category. The Annual Financial and Statistical Report summarizes the financial data. This report is published annually and posted to the Web site in portable document format (.pdf). Raw data can be downloaded from the Web site in Microsoft Access and Excel formats.

2. The Profile of Educational Personnel (PEP) database houses information about every public school staff member, including certified staff such as teachers and principals and noncertified staff such as bus drivers. The Profile of Educational Personnel database includes information on staff job code(s), salary, education level, years of experience, gender, race, and ethnicity. Class codes indicating all the classes taught by a teacher are also reported. District data summary tables are downloadable in Microsoft Excel format and published annually in two reports: Standard Teacher Counts and Salary Averages and Reported Personnel and District Salaries. Budgeted and actual end-of-year figures for staff and salaries (as of October 1) are reported. School districts submit Profile of Educational Personnel data to the state every fall and spring for the current school year.

3. The Student Information System (SIS) database includes information about every student enrolled in the public school system in Louisiana, including students in grades K–12, prekindergarten classes, infant and preschool programs, and nongraded classes. Districts report data annually (as of October 1) on each student's gender, race/ethnicity, free or reduced-price lunch program participation, limited English proficient status, special education status, class codes, and other variables. School and district summary tables are downloadable in Microsoft Excel format and available in portable document format (.pdf) from the Multiple Statistics Report on the agency's Web site.

4. The Louisiana Department of Education uses the Annual School Report to verify teacher certification, class size, and other measures. Districts submit data to the state every fall for the current school year. School and district summary reports are posted annually in the District Composite Reports, available on the Planning, Analysis, and Information Resources Web site in portable document format (.pdf).

In addition to the four databases managed by the Planning, Analysis, and Information Resources division, two other divisions in the Louisiana Department of Education manage student performance and teacher certification data (see Table LA1).

5. The Division of Student Standards and Assessment manages all student achievement data. This division maintains a central Web site (<http://www.doe.state.la.us/lde/ssa/testhome.html>) with summary reports of test data in portable document file (.pdf) format. School-, district-, and state-level data are also downloadable in Microsoft Excel format. Data reflect results from spring and summer administrations of the state's criterion-referenced and norm-referenced tests. Student test results are also published annually in the District Composite Reports. Users may also request student achievement data directly from the Louisiana Department of Education.

6. The Division of Teacher Certification and Higher Education houses the Teacher Certification Database (TCR), which contains information about every public school teacher certified to teach in Louisiana. Division staff update the database daily as requests for certification are received and completed. It includes information about every teacher's certificate type and level, certification area(s) and academic degree(s). The Web site (<http://www.teachlouisiana.net>) has a search tool enabling public users to look up information about teachers by name. The District Composite Reports provide teacher certification and

qualification information on an annual basis. However, the Web site contains neither downloadable raw data nor documentation on data variables.

Table LA1

*Summary of Existing State Databases, Louisiana*

Data Category	State Database	Managing Agency/Department
Instructional expenditures	Annual Financial Report (AFR)	Louisiana Department of Education Division of Planning, Analysis, and Information Resources
Staff characteristics	Profile of Educational Personnel (PEP) Annual School Report (ASR)	Louisiana Department of Education Division of Planning, Analysis, and Information Resources
Student characteristics	Student Information System (SIS) Annual School Report (ASR)	Louisiana Department of Education Division of Planning, Analysis, and Information Resources
Student performance	Test results database (TST) and Web site	Louisiana Department of Education Division of Student Standards and Assessment
Teacher characteristics	Teacher Certification Database (TCR)	Louisiana Department of Education Division of Teacher Certification and Higher Education

*Instructional Spending*

Money expended for instructional purposes by school districts in Louisiana can be examined via two data sources. First, data on each district’s spending in specific instructional categories are available from the Annual Financial Report database. School-level expenditures are estimated for a limited range of function categories. Second, data on salaries can be obtained on individual staff persons from the Profile of Educational Personnel database. These data sources are summarized in Table LA2 and described below.

Table LA2

*Measures of Instructional Expenditures From District Financial Data, Louisiana*

Fiscal Measure	Variables Available	Description	Unit of Analysis
Instruction-related expenditure functions	Instruction	Activities dealing directly with the interaction between teachers and students	District School
	Student support services	Activities designed to assess and improve the well-being of students and to supplement the teaching process	District School
	Instructional staff support services	Activities associated with assisting the instructional staff with the content and process of providing learning experiences for students	District School
	General administration	Activities concerned with establishing and administering policy for the district	District
	School administration	Activities concerned with the overall administrative responsibility for a school	District
	Additional functions		District
Instruction-related expenditure objects	Salaries	Amounts paid to both permanent and temporary district employees, including substitutes	District
	Benefits	Amounts paid by the district on behalf of employees	District
	Additional objects		District
Staff salary data	Base pay	The employee's regular salary	Individual
	Extra compensation	Additional salary paid to an employee for additional duties outside his or her regular job assignment, such as coaching, yearbook advisor, and cheerleader sponsor	Individual
	Extended employment pay	The additional salary paid to vocational education instructors	Individual
	Professional Improvement Program salary amount	The additional amount of salary provided to an employee who is a participant in the Professional Improvement Program (PIP)	Individual

*Instructional Expenditures.* District-level fiscal data submitted via the Annual Financial Report include expenditures by function, object, and program. School districts in Louisiana maintain highly detailed fiscal data. However, the expenditure data submitted to the state consist of less-detailed summary data elements identified by keypunch codes. Each keypunch code represents the expenditure amount for a unique combination of function, object, and program

codes. For example, keypunch code 0015420 stands for the amount paid under the instruction function for salaries for kindergarten teachers in the regular program.

The fiscal data include expenditures for the following three function categories related to instruction:

1. The instruction function category is defined as activities dealing directly with the interaction between teachers and students. Expenditures in this function category are broken down by the following programs: regular education; special education; vocational education; other instructional programs such as driver's education, ROTC, band, and athletics; special programs such as bilingual education and prekindergarten; adult/continuing education; and community college programs. Within each of these program areas, expenditures are broken down into salaries (and several salary subcategories); employee benefits; purchased professional and technical services; repairs and maintenance services; tuition; travel expense reimbursements; instructional supplies; and equipment.

2. The pupil support services function is defined as activities designed to assess and improve the well-being of students and to supplement the teaching process. Expenditures in this function category are broken down into the following areas: child welfare and attendance services; guidance services; health services; pupil assessment and appraisal services; and other pupil support services. Within each of these areas, expenditures are broken down into salaries (and several salary subcategories); purchased professional and technical services; repairs and maintenance services; travel expense reimbursements; materials and supplies; and equipment. Employee benefits are reported as a total under pupil support services.

3. The instructional staff support services function category includes activities associated with assisting the instructional staff with the content and process of providing learning

experiences for students. Expenditures in this function category are broken down into the following areas: salaries of directors, supervisors, and coordinators; salaries of clerical and secretarial staff; instruction and curriculum development services; travel expense reimbursements; instructional staff training services; school library services; other educational media services; and other instructional staff services. Within each of these areas, expenditures are reported in numerous subcategories. Employee benefits are reported as a total under instructional staff services.

Object-level expenditures are also available in the Annual Financial Report data (salaries, benefits, and other objects). Datasets made available by the Louisiana Department of Education include total salary expenditures for a wide range of staff positions (e.g., elementary teachers in the regular program, principals, superintendents).

Salaries are reported separately for a variety of staff categories within each program under the instruction function. In the regular education program, salaries are reported separately for kindergarten teachers, elementary teachers (grades 1–8), secondary teachers (grades 9–12), and aides. In the special education program, salaries are broken down for teachers, therapists (physical therapy, occupational therapy, speech therapy, etc.), and aides. The gifted and talented program includes teachers and aides. The vocational education program includes agriculture teachers, home economics teachers, industrial arts teachers, business teachers, other vocation education teachers, and aides. Driver education, ROTC, band, athletics, Improving America’s Schools Act, bilingual education, prekindergarten, adult/continuing education, and community college programs include teachers and aides. All of these programs also report salaries for substitute teachers and aides as well as salaries for staff on sabbatical leave.

Salaries also are reported separately for a variety of staff categories under the support services function and its subfunctions, including pupil support, instructional staff services, general administration, and school administration. Under pupil support services, salaries are broken down for child welfare and attendance services; guidance services; health services; pupil assessment and appraisal services; and other pupil support services. Within these areas, salaries are listed separately for supervisors, counselors, nurses, physicians, dental hygienists, psychologists, social workers, and clerical staff. Under instructional staff services, salaries are listed separately for directors, supervisors, and coordinators; clerical staff; instruction and curriculum specialists, staff instructors, library supervisors, librarians, library aides, and audiovisual services personnel. Under general administration, salaries are listed separately for board of education members, board clerical staff, board legal services staff, superintendents, superintendent's clerical staff, assistant superintendents, assistant superintendent's clerical staff, and other executive administrative staff. Under school administration, salaries are listed separately for principals, assistant principals, and clerical staff.

The Annual Financial Report is the only source of benefits data available in Louisiana. Benefits expenditures are reported separately for each program under the instruction function (including regular education, special education, vocational education, other instructional programs, special programs, adult/continuing education, and community college programs) and for each of the support services subfunctions (including pupil support services, instructional staff services, general administration, and school administration). For each of these areas, benefits expenditures are reported separately for group insurance; Social Security; Medicare; employer's contribution to Louisiana's teacher retirement system, Louisiana's school employees' retirement,

and other retirement; unemployment compensation; worker's compensation; health benefits for retirees; sick leave severance pay; and other employee benefits.

*Individual Staff Salary and Benefits Data.* School districts submit Profile of Educational Personnel data to the Louisiana Department of Education twice a year, including salary amounts budgeted for every job position as of October 1 and salary amounts actually paid to every employee within the current fiscal year during the June 30 collection.

The Profile of Educational Personnel database includes four salary amounts for every employee: (a) base salary, defined as the employee's regular salary (including overtime pay for the entire year during the June 30 collection); (b) extra compensation, defined as the additional salary paid to an employee for additional duties outside of his or her regular job assignment, such as coaching, yearbook advisor, and cheerleader sponsor; (c) extended employment compensation, defined as the additional salary paid to vocational education instructors; and (d) Professional Improvement Program salary supplement, defined as the additional amount of salary provided to an employee who is a participant in the Professional Improvement Program. No information regarding benefits is collected at the individual staff level.

*Data Usability.* The accessibility and quality of data on instructional spending in Louisiana support the use of these data for policy research. District-level data from the Annual Financial Report and Profile of Educational Personnel are available online. Individual staff data from the Profile of Educational Personnel can be requested from the Louisiana Department of Education and easily aggregated to school and district levels. Data documentation for Annual Financial Report and Profile of Educational Personnel data are also available online and are fairly user-friendly. In addition to the raw datasets, the Louisiana Department of Education makes several reports and summaries available that are helpful to research audiences.

One limitation of these data is the lack of complete school-level data. School-level Annual Financial Report data were obtained by special request for the purposes of this study. However, these data represent estimates based on individual salary data and district-level fiscal data, not actual school expenditures. Also, only one year (2002–2003) and only two function categories (no object-level data) are available. Another limitation is the lack of benefits data at the individual staff level. Researchers interested in estimating expenditures on individual staff benefits must use a calculation of district-level benefits data and individual-level salary data.

Table LA3

*Strengths and Challenges of Instructional Expenditure Data That Affect Their Use for Policy Research, Louisiana*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>• Complete Annual Financial Report district-level data are available online.</li> <li>• Documentation for the Annual Financial Report and Profile of Educational Personnel data is available and updated annually.</li> </ul>	<ul style="list-style-type: none"> <li>• Individual- and school-level data from the Profile of Educational Personnel must be requested from the Louisiana Department of Education.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>• A comprehensive variety of expenditure categories is available by function, object, and program.</li> <li>• Individual salary data are reported as four components in the Profile of Educational Personnel.</li> </ul>	<ul style="list-style-type: none"> <li>• Individual-level benefits data are not reported.</li> <li>• Actual school-level expenditure data are not reported (only estimates).</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>• The Louisiana Department of Education has multiple automatic mechanisms for checking the accuracy of Annual Financial Report and Profile of Educational Personnel data.</li> </ul>	
Consistency	<ul style="list-style-type: none"> <li>• Annual Financial Report and Profile of Educational Personnel databases have been mainly consistent over time.</li> <li>• Changes in teacher salary calculations are well-documented.</li> </ul>	<ul style="list-style-type: none"> <li>• Due to changes in data on the full-time equivalency (FTE) of staff positions, Profile of Educational Personnel salary average calculations have changed over time.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>• Profile of Educational Personnel salary data and Annual Financial Report function and object codes are aligned.</li> </ul>	

*Staff Characteristics*

The Profile of Educational Personnel database contains information about staff characteristics. This database includes information collected at the individual level regarding all staff, including certified staff (e.g., teachers, administrators, and instructional support staff) and uncertified staff (e.g., bus drivers). Data include variables for gender, race/ethnicity, job codes with corresponding full-time equivalency (FTE), education level, and years of professional experience. For teachers, pilot data for the 2002–2003 school year include all classes taught

during that school year. The Teacher Certification Database contains information on all teachers and includes data elements such as state certification types, certification areas, degrees, academic institutions, national board certification, and teacher test scores (on the NTE, WCET, and PRAXIS). Also, data on a teacher's route to certification (standard or alternative) are available from two sources: (a) as part of practitioner license information and (b) with teacher degree codes.

Table LA4

*Staff Characteristics Available in State Databases, Louisiana*

Staff Characteristic	Variables Available	Unit of Analysis	Source
Demographics	Gender and race/ethnicity	Individual	Profile of Educational Personnel
Job code	Each job assigned to an individual (multiple codes possible)	Individual	Profile of Educational Personnel
Full-time equivalency (FTE)	Full-time equivalency in each job code	Individual	Profile of Educational Personnel
Class codes	Classes taught (for teachers, pilot data 2002–2003)	Individual	Profile of Educational Personnel
Experience	The years of experience on which a salary is based	Individual	Profile of Educational Personnel
Education	Education level	Individual	Profile of Educational Personnel
	Degree (e.g., BA, BS)	Individual	Teacher Certification Database
	Degree institution	Individual	Teacher Certification Database
Certification	Certificate type (i.e., standard, nonstandard, and practitioner license)	Individual	Teacher Certification Database
	Certificate level (i.e., A, B, C)	Individual	Teacher Certification Database
	Certification area	Individual	Teacher Certification Database
	National board certification	Individual	Teacher Certification Database
	Route to certification	Individual	Teacher Certification Database
Test scores	Scores on NTE, WCET, or PRAXIS	Individual	Teacher Certification Database

*Counts and Ratios.* Staff full-time equivalency (FTE) counts can be calculated by job code, school, district, and demographic characteristics. Researchers also can calculate staff ratios

including pupil:teacher, pupil:administrator, and teacher:administrator. The Annual School Report includes information about class size ranges at the school level, indicating the number and percentage of core classes with 1–20 students, 21–26 students, 27–34 students, and more than 34 students.

Table LA5

*Student and Staff Counts and Ratios, Louisiana*

Count/Ratio Measure	Data Available	Unit of Analysis	Source
Staff full-time equivalency (FTE) counts	Can be calculated with existing data	Job code School District Demographics	Profile of Educational Personnel
Class size	Class size reported by school districts	School District	Annual School Report
Pupil:teacher Pupil:administrator Teacher:administrator	Can be calculated from existing data	School District	Profile of Educational Personnel

*Data Usability.* State data in Louisiana contain useful information about individual staff, with an emphasis on classroom teacher data. Datasets and reports are easily accessible; many are downloadable from the agency’s Web site, and annual staffing reports have used consistent formats over time. The inclusion of all staff (not simply certified staff) in the Profile of Educational Personnel database provides for one central source of staffing data. Two collection periods (October 1 and end of year) yield a complete and updated picture of the state’s education staff. Users can keep track of multiple job records for any individual staff by using the full-time equivalency measures for staff positions. For example, one teacher may be employed at one school for 75 percent of a full-time equivalency as a regular classroom teacher and at another school (and possibly in another district) for 25 percent of a full-time equivalency as a special education teacher. Class codes link teachers to the courses they teach and will link teachers and

students starting in 2004–2005. Documentation for the Profile of Educational Personnel database is available on the Louisiana Department of Education Web site and is updated annually.

Other strengths include the fact that the Teacher Certification Database contains all certification and education records for the state’s teachers. Teachers with up to seven certificate types, up to 16 certification areas, and up to seven degree/institution records were found in the Teacher Certification Database. The use of three certification levels (A, B, and C) makes it possible to identify new teachers, experienced teachers who have passed the state’s assessment program, and experienced teachers with master’s degrees. School-level reports showing the number of classes taught by highly qualified teachers integrate data on teacher certification level and subject areas and classes taught. Researchers can request individual-level data contained in the Profile of Educational Personnel and Teacher Certification Database from the Louisiana Department of Education. These individual data can be aggregated to school and district levels.

Major concerns regarding the Teacher Certification Database are the lack of printed documentation and the fact that it is updated continuously with no year-to-year archiving of information. Constructing a subset of certified teachers for any given study period is somewhat difficult and time-consuming. The annual District Composite Report includes year-to-year school-level summaries of teacher certification information, but this information is not consistent over time. Specifically, data from the 2000–2001 school year are available on the number and percentage of certified teachers, whereas the 2002–2003 report includes number and percentage of classes taught by highly qualified teachers, and no information is available for 2001–2002. A related challenge concerns the changes in the state’s certification structure. Changes have occurred over the last several years, making it difficult to create a coherent picture of the state’s teacher certification data.

A major challenge regarding the Profile of Educational Personnel database is the inconsistent reporting of staff years of experience. State data managers reported that school districts interpret the definition of this measure inconsistently, making it unclear whether these data reflect staff experience in a position (job code), at the current school or district, or in the profession. To reduce inconsistency in these data, the Louisiana Department of Education checks the years of experience against certification status, which in part corresponds to years of teaching experience.

Another concern is the use of multiple databases for staff data, increasing the likelihood of misaligned data. Staff records are located in the Profile of Educational Personnel database, the Teacher Certification Database, and a database containing teacher test scores. Each of these databases uses different unique identifiers to organize staff records that must be reconciled before data can be merged. Also, the lack of specific grade-level and subject-area identifiers makes it difficult to link teachers to the grades and subjects that they teach. Although class codes and certification data provide some information on the grade levels and subjects that each teacher is teaching (or is certified to teach), this information is only approximate. Additionally, it is difficult to link teachers to specific student achievement results, which are reported at the grade level and separately for various subject areas (e.g., grade 4 English language arts or grade 8 mathematics).

Table LA6

*Strengths and Challenges of Staff Data That Affect Their Use for Policy Research, Louisiana*

Criterion	Strength	Challenge
Availability and accessibility	<ul style="list-style-type: none"> <li>• Many datasets and reports are available online.</li> <li>• The use of anonymous identifiers (as opposed to Social Security numbers) protects confidentiality.</li> <li>• Profile of Educational Personnel User Guide is updated annually.</li> </ul>	<ul style="list-style-type: none"> <li>• Individual-level data must be requested from the Louisiana Department of Education.</li> <li>• No printed Teacher Certification Database documentation.</li> <li>• Online data are not available in formats conducive to research use (downloadable raw data).</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>• Individual-level data are available.</li> <li>• Profile of Educational Personnel database is a central source of data for all staff.</li> <li>• All Profile of Educational Personnel data are prorated by full-time equivalency.</li> <li>• Two data collection periods are required for the Profile of Educational Personnel data.</li> <li>• Teacher Certification Database includes data on highly qualified teachers and national board certification.</li> <li>• Separate records are maintained for every certificate, certificate area, and degree.</li> </ul>	<ul style="list-style-type: none"> <li>• No year-by-year teacher certification data are collected at the individual level.</li> <li>• Dates are incomplete in the Teacher Certification Database (e.g., year of degree, issue date, sequence of degrees attained).</li> <li>• No data are collected on teachers' degree major or coursework.</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>• Class size data are available and more accurate than pupil:teacher ratio.</li> </ul>	<ul style="list-style-type: none"> <li>• Years of experience data may not be accurate.</li> <li>• Full-time equivalency counts and headcounts are identical in school-level datasets.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>• Profile of Educational Personnel reports have been consistent over several years.</li> </ul>	<ul style="list-style-type: none"> <li>• Changes have been made over time in reporting of certification information.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>• Class code variable links teachers to classes taught (and will link teachers and students in 2004–2005).</li> </ul>	<ul style="list-style-type: none"> <li>• The use of several personal identifiers increases potential for misaligned data.</li> <li>• Linking teachers to grade levels and subjects taught is difficult.</li> </ul>

### *Student Performance*

Louisiana has developed a comprehensive system to assess student performance called the Louisiana Educational Assessment Program for the 21st Century (LEAP-21). This includes criterion-referenced tests in grades 4, 8, and 10 and norm-referenced tests in grades 3, 5, 6, 7, and 9. In addition, school-level accountability labels are used based on student achievement test results, attendance rates, and dropout rates.

*Criterion-Referenced Tests.* Students in Louisiana take the Louisiana Educational Assessment Program for the 21<sup>st</sup> Century (LEAP-21) tests in the spring of grades 4 and 8. These include tests in mathematics, English language arts, science, and social studies. Students take the Graduation Exit Exam (GEE-21) for mathematics and English language arts in the spring of 10th grade and for science and social studies in the spring of 11th grade.

After an extensive process of test development, the implementation of these tests was a gradual process. Starting in the spring of 1999, the Louisiana Educational Assessment Program for the 21<sup>st</sup> Century (LEAP-21) tests in mathematics and English language arts were given to students in grades 4 and 8. The Louisiana Educational Assessment Program for the 21<sup>st</sup> Century (LEAP-21) tests in science and social studies for grades 4 and 8 were added in the spring of 2000. The Graduation Exit Exam (GEE-21) for mathematics and English language arts for 10th grade were added in the spring of 2001. Finally, the Graduation Exit Exam (GEE-21) for science and social studies for 11th grade were added in the spring of 2002.

The criterion-referenced tests in grades 4 and 8 are used for promotion purposes, and those students who do not score at the required level are offered intensive summer remediation and the opportunity to re-test at the end of the summer. Similarly, the criterion-referenced tests in

grades 10 and 11 are used to determine eligibility for high school graduation, and those students who do not score at the required level are given re-test opportunities in the summer and fall.

The Louisiana Department of Education Web site provides downloadable files with achievement test results as well as reports and data documentation. The information regarding the Spring 2003 Louisiana Educational Assessment Program for the 21<sup>st</sup> Century (LEAP-21) and Graduation Exit Exam (GEE-21) test administrations is the most complete. It includes data files with statewide, district-level, and school-level results that indicate the number and percentage of students at each of five achievement levels (advanced, mastery, basic, approaching basic, and unsatisfactory). Data files include separate results for the initial (spring) test takers, the re-testers, and all test takers combined, as well as for the four subject areas. Less complete information is available for prior years.

*Norm-Referenced Tests.* Students in Louisiana take the Iowa Test of Basic Skills (ITBS) in the spring of grades 3, 5, 6, and 7 and the Iowa Test of Educational Development (ITED) in the spring of grade 9. These include tests in reading, language, mathematics, science, social studies, and sources of information. The test results for 1999, 2000, 2001, and 2002 were based on national normative data from 1995. However, the 2003 test results were based on normative data from 2000. Therefore, caution must be used when interpreting these data over time.

The Louisiana Department of Education Web site provides downloadable files with Iowa Test of Basic Skills (ITBS) and Iowa Test of Educational Development (ITED) test results as well as reports and data documentation. The information regarding the Spring 2003 test administration is the most complete. It includes data files with statewide, district-level, and school-level results that indicate the composite national percentile rank of the average standard

scores. As with the criterion-referenced test data, less complete information is available for prior years.

*State Accountability Rankings.* Louisiana's school-based accountability system is nationally recognized for its success. Each school in the state is rated every fall based on the school's performance the previous school year. The rankings are based on achievement test results (60 percent criterion-referenced tests and 30 percent norm-referenced tests) as well as on attendance and dropout rates (10 percent).

Table LA7

*Student Performance Tests, Louisiana*

Test	Type	Scoring	Grades	Subject Areas
Louisiana Educational Assessment Program for the 21st Century	Criterion-referenced test	Raw score Scale score Percentage of students at each of five achievement levels	4 and 8	English language arts Mathematics Science Social studies
Graduation Exit Exam	Criterion-referenced test	Raw score Scale score Percentage of students at each of five achievement levels	10 and 11	English language arts (10) Mathematics (10) Science (11) Social studies (11)
Iowa Test of Basic Skills  Iowa Test of Educational Development	Norm-referenced test	Composite national percentile rank of the average standard scores	3, 5, 6, 7, and 9	Reading Language Mathematics Science Social studies Sources of information

*Data Usability.* Student performance data for Louisiana are very accessible. Data are easily downloadable from the agency's Web site. Reports and data documentation are also available online. Individual student-level data, however, must be obtained by special request to the Louisiana Department of Education.

Researchers must be aware of the challenges concerning the use of criterion-referenced test scores. A major challenge of these test data is the lack of consistent testing over time. As discussed above, the criterion-referenced tests were phased in gradually, limiting the capacity for any analysis over time. Results are available for fourth- and eighth-grade English language arts and mathematics for 1999 through 2003. However, results for grades 4 and 8 in science and social studies only go back to 2000. Results for high school English language arts and mathematics go back to 2001, whereas high school science and social studies go back only to 2002. According to data documentation (*Annual Louisiana Educational Assessment Program for the 21st Century and Graduation Exit Exam Report from Spring 2003*), the difficulty of the tests remains the same from year to year through the use of a process known as test equating that involves scaled scores (computed from raw scores). However, data managers cautioned against any comparisons across years and across grades, which obviously represents a challenge to policymakers and researchers interested in longitudinal analysis.

The way that the test results are reported on the Louisiana Department of Education Web site also has changed over time. As mentioned above, the spring 2003 information is the most complete. Prior to this year, data files on the Web site did not include separate results for initial test takers, re-testers, and all test takers combined. Data files also did not indicate the number of students at each achievement level (that is, in some cases only the percentage of students at each level is listed). Furthermore, it is not always clear whether the results are for all test takers, initial test takers, or re-testers and if they represent number of students or percentages of students. Finally, the spring 1999 Louisiana Educational Assessment Program for the 21<sup>st</sup> Century data are available only at state and district levels (not school level). These challenges are surmountable, however. School-level analyses can be performed with data from the spring 2000 through spring

2003 tests, and conversations with data managers can clear up any confusion about the reporting of the results.

A major strength of the data from the norm-referenced tests is the capacity for analysis over time. The test administrations of the Iowa Test of Basic Skills (ITBS) and Iowa Test of Educational Development (ITED) have remained consistent from spring 1999 through spring 2002. A challenge concerns the spring 2003 test administration that yielded test results based on normative data from 2000 (a change from the earlier 1995 norms). Another challenge is the lack of detail in the test data available online because only composite scores are reported (no specific subject-area data). Finally, only statewide and district-level data are available online from the 1999 test administration; school-level data must be requested from the Louisiana Department of Education.

Two major strengths of the state accountability ratings are the reporting of adequate yearly progress (AYP) and the recent addition of the subgroups reports. The most obvious concerns with the system relate to the many changes since its inception in 1998–1999, the most recent being changes in the definitions of the performance labels (2002–2003) and of the growth labels (2003–2004).

Table LA8

*Strengths and Challenges of Student Performance Data That Affect Their Use for Policy Research, Louisiana*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>• School- and district-level performance data (percentage of students at five proficiency levels) are downloadable from the Louisiana Department of Education Web site.</li> <li>• Other score formats (raw score and scale score) can be requested from the Louisiana Department of Education.</li> </ul>	<ul style="list-style-type: none"> <li>• Student-level data are not publicly available and must be obtained by special request to the Louisiana Department of Education.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>• Student performance data are available on all test takers and on subgroups (free and reduced-price lunch program participants, race/ethnic groups, special education, and limited English proficient students).</li> </ul>	<ul style="list-style-type: none"> <li>• Criterion-referenced test scores are available for a limited number of years (i.e., grades 4 and 8 Louisiana Educational Assessment Program for the 21st Century and grade 10 Graduation Exit Exam).</li> </ul>
Accuracy		<ul style="list-style-type: none"> <li>• Criterion-referenced test data available on the Louisiana Department of Education Web site are limited to percentage of students at five achievement levels, limiting the full range of variability in test results for research purposes.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>• Grades tested for Iowa Test of Basic Skills, Iowa Test of Educational Development, and Louisiana Educational Assessment Program for the 21st Century, in combination, provide a consistent span of grade levels.</li> </ul>	<ul style="list-style-type: none"> <li>• Criterion-referenced test measures only go back a few years in some cases.</li> <li>• In 2003, the state added a pre-GED Iowa Test of Basic Skills.</li> <li>• Iowa Test of Basic Skills scores reflect 1995 norms until 2003, when the new 2000 norms were applied.</li> <li>• Accountability labels change over time.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>• Demographic and programmatic information about test takers are in some cases reported with test results.</li> </ul>	<ul style="list-style-type: none"> <li>• Due to changes in norming standards for the norm-referenced test and incompatible scaling for the criterion-referenced tests (grades 4, 8, and 10), possibility for longitudinal analysis is limited.</li> </ul>

*Student, School, and District Characteristics*

*Student Characteristics.* School districts submit data to the state on the characteristics of individual students via the Student Information System. Data elements include each student's gender, race/ethnicity, free and reduced-price lunch program participation, special education status, limited English proficiency (LEP) status, grade level, and other characteristics. Many important school and district characteristics can be derived from the student-level Student Information System data. The Louisiana Department of Education publishes numerous files on its Web site with aggregates of these data (the Multi-Stats Reports). Researchers also can request student-level and grade-level data from the Louisiana Department of Education.

Table LA9

*Data Available in State Education Databases on Student Characteristics, Louisiana*

Student Characteristic	Source			
	Individual	Grade	School	District
Gender	By request from the Louisiana Department of Education	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report
Race/ethnicity	By request from the Louisiana Department of Education	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report
Special education status	By request from the Louisiana Department of Education	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report
Limited English proficient (LEP) status	By request from the Louisiana Department of Education	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report
Free and reduced-price lunch program participation	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report	Multi-Stats Report
Grade enrollment	By request from the Louisiana Department of Education	Multi-Stats Report	Multi-Stats Report	Multi-Stats Report

*School Characteristics.* In addition to the student characteristics data that can be aggregated to the school level, several variables are available to measure school characteristics. These include type of school (elementary, middle/junior high, high, and combination school) and grades enrolled (e.g., kindergarten only, grades 2–5, grades 6–8). Four different student counts are available: K–12 student count, all elementary and secondary student count, students funded under the state’s funding formula, and all reported students.

*District Characteristics.* In addition to the student- and school-level characteristics that can be aggregated to the district level, district wealth measures are available. Two commonly used indicators include the local wealth factor and fiscal capacity per pupil. The school and district characteristics of interest to researchers are available from several databases, including the Annual School Report and the Annual Financial Report (discussed above), the Multi-Stats Reports, the Reported Salaries and Personnel, the Minimum Foundation Program Funding Formula Accountability Report, and online accountability reports.

Table LA10

*Data Sources for School and District Characteristics, Louisiana*

Characteristics	Data Sources	
	School	District
School type	Annual School Report	N/A
Grade range	Annual School Report	Annual School Report
Total enrollment	Multi-Stats Report	Multi-Stats Report
Class size	Annual School Report	Annual School Report
Number of teachers	Reported Salaries and Personnel	Reported Salaries and Personnel
Per pupil expenditures	MFP Funding Formula Accountability Report	Annual Financial Report
Accountability data	Online accountability reports	Online accountability reports
District wealth	N/A	Annual Financial Report

*Community Characteristics.* Education databases do not contain information about the characteristics of the communities within which schools or districts are located. Census information provides a number of relevant indicators for community well-being, including family income, parent education levels, and receipt of public assistance.

*Summary of Findings*

Data collected and managed by the Louisiana Department of Education provide useful information for resource allocation policy research. At the same time, improvements in ways that

data are collected, reported, and made available to data users could enhance the capacity of these data.

*Accessibility.* Most of the education data in Louisiana are accessible through the central Data and Reports section of the Louisiana Department of Education Web site. Data are available online on instructional spending; staff characteristics; student performance; and student, school, and district characteristics. Much information is available at state and district levels, although some is also available at the school level. Student characteristics and achievement test results are reported at the grade level. Additional data can be requested easily and obtained in a timely manner from the Louisiana Department of Education, whose staff and data managers are both knowledgeable and helpful.

The accessibility of these data would be improved if additional datasets were made available online (e.g., school-level fiscal and staffing data; individual-level student and staff data with anonymous identifiers that are consistent across datasets; raw data in Microsoft Access or SAS formats; and raw and scale score formats of student achievement data). The accessibility of these data would also be enhanced with improved data documentation that is posted on the same Web site. Improved documentation of student achievement data and teacher certification and education data would be especially helpful.

*Alignment.* The consistent use of numeric district- and school-level identifiers makes it possible to aggregate individual student and staff data to these levels. Individual-level student and staff data also make it possible to specify which individuals should be included in a given aggregate (e.g., all classroom teachers or only classroom teachers in the regular program in a given school or district).

Regarding the alignment of various types of staffing data, the use of several different identifiers is somewhat problematic. When collecting data on teacher salary, experience, certification, education, and test scores, researchers originally obtained separate data files, which included four different identifiers. A subsequent request to the Louisiana Department of Education yielded data files with only two different identifiers, but the potential of misaligned data was not eliminated. Obviously, the usability of these data would be improved by the use of a single identifier.

The possibility of linking teachers to the grades and subjects that they teach (and thus to student achievement results, which are reported separately by grade level and subject area) is uncertain but may possibly be achieved through the use of class codes and/or certification area data. Finally, the education data have the capacity to link teachers to the actual classes they teach during a given school year. For the 2002–2003 school year, data also were collected on the number of students in each class taught. Data collection is currently being piloted to link students to classes (which will allow the linking of teachers and students) and is projected to be fully in effect starting with the 2004–2005 school year.

*Usability.* The education data from the Louisiana Department of Education have high usability for policy research because they are generally complete, accurate, and consistent. In terms of completeness, data are available at a great level of detail and without overwhelming complexity. Much information is collected at the individual student and staff levels. The sophisticated staffing system allows for the prorating of full-time equivalents (FTEs) and salaries through one central database that includes all education staff (not simply certified staff or instructional staff); student achievement results can be reported along with the demographics of the test takers and for various student subgroups. Additional indicators of completeness include

class size data, the class codes that soon will link teachers and students, and the teacher certification database with separate records for each of a given teacher's certificates and academic degrees (as opposed to current certificate or highest degree).

More detailed data would nevertheless enhance usability. Lower levels of data would improve the capacity for research use. For example, actual school-level expenditures (as opposed to estimates) and individual staff data on benefits would provide important detail to financial data. Additional data that would be useful for research purposes include each teacher's degree major and coursework. Criterion-referenced student achievement data for additional grade levels also would greatly enhance the potential for research; the Louisiana Department of Education is currently developing test items for new criterion-referenced tests to be added to the current tests for grades 4, 8, and 10.

In terms of accuracy, examinations of these data along with conversations with data managers showed that the education data are generally valid, accurate representations of what they are intended to measure. Among the few exceptions are data on staff years of professional experience, which are problematic due to inconsistent reporting by districts. Data accuracy might of course be improved with better instructions on what type of experience to report (years of experience in the current job assignment, at the school, in the district, or in the profession). Examinations of school-level staffing aggregates revealed no differences between the full-time equivalency count data and the headcount data, which also may indicate inaccurate reporting.

Finally, in terms of consistency, most of the Louisiana Department of Education data have been fairly consistent during the period of years examined for this study. However, teacher certification data and reports have undergone certain changes due to shifts in the certification structure and requirements, and data on teacher test scores have been inconsistent due to changes

in the test used to assess teacher skills and knowledge. Even more importantly, the implementation of new criterion-referenced student achievement tests starting in 1998–1999 limits the capacity for certain analyses over time; the worst case is high school science and social studies because the new test was not implemented until the spring of 2002. The possibility may exist for conducting valid school-level analyses of improvements in student achievement by comparing fourth-grade achievement for several consecutive years, even though the process of test equating (which is supposed to make the test equally difficult from year to year) is imperfect. However, the ability of researchers to conduct any longitudinal cohort analysis—where individual students are tracked over time—depends on having student-level data as well as comparable test scaling (e.g., from the fourth-grade to the eighth-grade criterion-reference tests). Cohort analysis may be conducted with the norm-referenced student achievement data up until the spring of 2003, when the national norming group changed. However, policymakers tend to view the norm-referenced test as less relevant than the criterion-referenced test, making a longitudinal analysis of criterion-referenced scores the preferred choice.



## Appendix D

### New Mexico State Education Data

The New Mexico Public Education Department is the primary source of education data for the state. The department oversees the provision of education services in 750 schools organized into 89 districts. Information is collected on financial activity in each school district, on the characteristics of more than 20,000 instructional staff, and on the performance and demographics of over 300,000 students per year. Data collection and management are guided largely by the reporting requirements of state and federally funded programs, data needs of the state's accountability system and teacher accreditation system, and the state's financial reporting and accountability mechanisms.

#### *Overview of Existing State Data*

For the purposes of this study, researchers examined the following four major databases in New Mexico that provide information about instructional expenditures, staff and student characteristics, teacher certification, and student performance (see Table NM1).

1. Financial information about New Mexico school districts is collected and managed by the School Finance Unit at the New Mexico Public Education Department. The New Mexico Public Education Department collects financial information from all districts and charter schools in the state and organizes these data into multiple categories, including expenditures, revenues, estimated budgets, cash balances, and capital improvements and debt. Instructional expenditures, of specific interest to this study, are organized into a chart of accounts with a standard set of funds, functions, and objects. Data are compiled into one document, *New Mexico Public School Finance Statistics*, and downloadable from the New Mexico Public Education Department Web site (<http://www.ped.state.nm.us/div/fin/school.budget/nm.stat.03/index.html>). Definitions of

fiscal variables are recorded in the agency's document *Supplements to the Manual of Procedures* and may be requested from the School Finance Unit staff.

2. The Accountability Data System (ADS) is the statewide student and staff information system for K–12 public education in New Mexico. School districts are asked to collect and submit detailed student and staff information for inclusion in the Accountability Data System. Data are collected on all public school students enrolled one-half time or more and on all certified and noncertified staff (including short- and long-term substitutes). Districts are required to submit student and staff data for three reporting periods ending on the 40th, 80th, and 120th days of the school year. Although summaries of information collected through the Accountability Data System are posted to the New Mexico Public Education Department Web site (<http://www.ped.state.nm.us/div/ais/data/dcrfactsheets.html>), data files must be requested from agency staff. Accountability Data System variables are defined in the agency's document *Accountability Data System Information Manual*, which is also available by request from the agency's Chief Information Office.

3. The Educator Quality Support Unit at the New Mexico Public Education Department collects and manages a licensure database that contains certification information about each individual teacher in the state. These data result from application information and teacher test scores that are submitted to the unit as part of the teacher licensure process. Staff upload data from the licensure database to the Accountability Data System on a regular basis to allow for wider agency use of these data. Data must be requested from the Education Quality Support Unit. Data documentation and variable definitions, however, are not recorded on any printed or electronic source.

#### 4. The Accountability and Assessment Unit at the New Mexico Public Education

Department manages and reports on the state's student performance results. The unit collects multiple measures of student performance, including a norm-referenced student achievement test, a high school competency exam, a state writing assessment, and a Spanish-language achievement test. Data are compiled on all of these tests for all students that take the exam(s). Student performance data may be requested from the agency's Accountability and Assessment Unit or the Chief Information Office. Data documentation and variable definitions, however, are not recorded on any printed or electronic source.

Table NM1

#### *Summary of Existing State Databases, New Mexico*

Data Category	State Database	Managing Agency/Department
Instructional expenditures	New Mexico Public School Finance Statistics	New Mexico Public Education Department, School Finance Unit
Staff characteristics	Accountability Data System	New Mexico Public Education Department, Accountability and Assessment Unit
Student characteristics	Accountability Data System	New Mexico Public Education Department, Accountability and Assessment Unit
Student performance	Student performance test results	New Mexico Public Education Department, Accountability and Assessment Unit
Teacher licensure	Licensure Database	New Mexico Public Education Department, Educator Quality Support Unit

#### *Instructional Spending*

Dollars spent for instructional purposes by school districts in New Mexico can be measured through two data sources. First, researchers can obtain financial data on each school district on spending in specific instructional areas. Second, researchers can request salary information on individual instructional staff persons from the Accountability Data System. These data sources are summarized in Table NM2 and described below.

Table NM2

*Measures of Instructional Expenditures From District Financial Data, New Mexico*

Fiscal Measure	Variables Available	Description	Unit of Analysis
Instruction-related expenditure functions <sup>a</sup>	Direct instruction	Expenditures related to direct delivery of instruction, including expenses for teachers, substitutes, and instructional assistants	District
	Instructional support	Expenditures related to support of instruction (expenses for principals, instructional coordinators, and student support staff)	District
	Administration	Expenditures related to administration of the district, including expenses for superintendent, administrative staff, and board members	District
Instruction-related expenditure objects <sup>a</sup>	Personnel services	Expenditures for compensation (not including benefits) paid to staff	District
	Employee benefits	Expenditures for benefits provided to staff (insurance, retirement, worker's comp, etc.)	District
	Purchases services	Expenditures for purchases (contracted services, rents and leases, maintenance and repair, etc.)	District
	Supplies and materials	Expenditures for materials such as textbooks/software and general supplies	District
	Travel and training	Expenditures for travel and training for staff, board members, parents, and/or students	District
	Capital outlay	Expenditures for fixed (\$1,000 and over) and supply (under \$1,000) assets	District
Staff salary data <sup>b</sup>	Salary	<ul style="list-style-type: none"> <li>Annual base salary rounded to the nearest dollar (does not include extra service pay)</li> <li>Partial salaries for staff with multiple roles are not reported but can be estimated by using full-time equivalency (FTE) count data</li> </ul>	Individual classified staff
	Source of salary	Percent of base salary paid from <ul style="list-style-type: none"> <li>State operational funds</li> <li>Federal funds</li> <li>Medicaid in the schools funds</li> <li>Private funds</li> <li>Public funds other than state operational</li> </ul>	Individual classified staff

<sup>a</sup>These data are contained in the Chart of Accounts.

<sup>b</sup>These data are contained in the Accountability Data System.

*Instructional Expenditures.* Two function categories collected by school districts in New Mexico pertain to the expenditures dedicated for instruction: (a) direct instruction and (b) instructional support (see Table NM2). Direct instruction includes payroll spending (personnel

services and employee benefits) for teachers, substitutes, and instructional assistants. It also includes spending within the other object categories under this function, including purchased services, supplies and materials, travel and training, and capital outlay (fixed and supply assets) that pertain to classroom instruction. Instructional support includes payroll spending for staff who directly or indirectly support instruction of students (e.g., principals, instructional coordinators, student support staff). It also includes spending in the object categories mentioned above that relate to instructional support activities. An additional function category that is indirectly related to instructional spending but important for comparative purposes is administration. This category contains spending for central administration, including the costs of the superintendent and administrative support.

*Individual Staff Salary Data.* Salaries for instructional and administrative staff can be determined using the broad fiscal categories described in the financial data above. For individual teachers, instructional support staff, student support staff, and administrative staff, salary data are collected in the Accountability Data System. Each staff record contains a base salary amount as well as data on the source(s) of revenue that funded the base salary.

*Data Usability.* Researchers considered data on instructional spending from both the financial database and the Accountability Data System for their potential usefulness for policy research purposes (see Table NM3). Overall, the district-level data on instructional expenditures and the individual-level staff salary data would provide useful data sources for conducting resource allocation research. These data are available via two sources, one providing a district-level perspective of overall spending in instruction and the other providing detailed information about salaries that could be aggregated to grade or classroom salary measures. Data on district spending for instructional functions and objects are downloadable from the New Mexico Public

Education Department Web site, and detailed documentation on these data is available by request from the School Finance Unit. According to data managers, database contents and data definitions for instructional expenditures in the financial database have not changed substantively during the years considered for this study (1999–2003). The individual salary data from the Accountability Data System also have been collected in a consistent manner from 1999 to 2003. The individual salaries also can be aligned directly to staff characteristics that are also located in the Accountability Data System. This allows researchers to use staff information on full-time equivalency of different positions to estimate, for example, how much of an individual's salary is dedicated to instructional or noninstructional positions.

A significant amount of data on instructional spending are collected and reported in state education databases and could, in theory, be used in policy research. The following four challenges that researchers face in this application are apparent.

1. Access to data from the Accountability Data System is restricted and requires a special request to the New Mexico Public Education Department.

2. Although data on spending on instructional function and object categories are available at the state and district levels, similar information is not collected by the agency for school-level spending.

3. The individual-level salary data that are provided via the Accountability Data System are not consistent with the district-level fiscal salary data. The Accountability Data System provides the base salary being paid to each staff person reported at the three reporting dates (40th, 80th, 120th days) and also labels the district at which the staff person works; however, an aggregation of all salaries for one district would not align to the actual amount expended for salaries at that district as recorded in the financial database. This is because the number of days a

staff person is employed is not tracked. Additionally, definitions differ between the base salary in the Accountability Data System and personnel services object in the financial database.

4. Finally, spending for staff benefits is tracked in the fiscal database and broken down into subcategories (educational retirement, retiree health care, health/medical, life, dental, etc.). However, since benefits spending data are available only at the district level, researchers cannot determine the cost of benefits or extra duty assignments for individual staff within a district. Thus, allocation of benefits for individual employees must be calculated as a proportion of all district spending on benefits rather than as an actual cost for each employee.

Table NM3

*Strengths and Challenges of Instructional Expenditure Data That Affect Their Use for Policy Research, New Mexico*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Data are available from two sources: district expenditures and individual staff salaries.</li> <li>District financial data are downloadable in Microsoft Excel spreadsheets from the New Mexico Public Education Department Web site.</li> <li>Data documentation is updated annually and available by request from the New Mexico Public Education Department.</li> </ul>	<ul style="list-style-type: none"> <li>Access to staff salary data is restricted and requires special request to the New Mexico Public Education Department.</li> <li>School level expenditure data are not collected.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>District financial data are available for all districts and all years of the study period.</li> <li>Staff salary data are collected for certified and non-certified staff for all schools and all years of the study period.</li> </ul>	<ul style="list-style-type: none"> <li>Some data collection problems persist, especially for districts that encounter changes in leadership or accounting staff.</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>Data managers report that consistency of the financial data collection process has increased the accuracy of district data reports.</li> <li>Automatic error checking is conducted before the districts formally submit data to the New Mexico Public Education Department.</li> </ul>	<ul style="list-style-type: none"> <li>Some data collection problems persist, especially for districts that encounter changes in leadership or accounting staff.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>No substantive changes were made in data collection procedures or variable definitions during the study period.</li> </ul>	<ul style="list-style-type: none"> <li>Different reporting procedures for staff salary data and district salary expenditure objects create noncomparable data.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>Individual staff salary data can be aligned with other staff characteristics.</li> <li>Staff salary data can be averaged across grades, schools, and districts.</li> </ul>	<ul style="list-style-type: none"> <li>Staff benefits are collected at the district level and not at the individual level.</li> <li>Individual-level expenditures for benefits can only be estimated by averaging across all staff in a district.</li> </ul>

*Staff Characteristics*

Information about staff is collected at the individual level in the Accountability Data System. Data measures exist for demographic characteristics of staff, information about the classroom assignment of teachers and aides, and full-time equivalents of particular staff positions

in schools and districts. Additionally, the Education Quality Support Unit of the New Mexico Public Education Department collects teacher certification information, which is regularly uploaded to the Accountability Data System database (see Table NM4). The Accountability Data System database also contains individual-level staff characteristics collected at the 40th, 80th, and 120th days of each school year. Certification data and teacher test scores are collected and maintained separately from the Accountability Data System; however, contents of the database are regularly uploaded to this data system. One feature of the licensure database is that it is continually updated without archiving, so no year-to-year data exist. Further limiting the usability of this data for policy research is the lack of issue date and end date information for certification.

Table NM4

*Staff Characteristics Available in State Databases, New Mexico*

Staff Characteristic	Variables Available	Unit of Analysis	Source
Position and full-time equivalency count	Position of staff person and full-time equivalency devoted to each position the individual fills	Individual	Accountability Data System
Experience	Years of experience in the district	Individual	Accountability Data System
	Years of experience out of district	Individual	Accountability Data System
Education	Bachelor's degree institution	Individual	Accountability Data System
	Highest degree earned	Individual	Accountability Data System
	Highest degree institution	Individual	Accountability Data System
Demographics	Gender	Individual	Accountability Data System
	Race/ethnicity	Individual	Accountability Data System
	Birth date	Individual	Accountability Data System
Certification (teachers)	Subject area of license	Individual	Licensure Database
	Grade level of license	Individual	Licensure Database
	Type of license (standard, waiver, emergency, etc.)	Individual	Licensure Database
	Level of license (1–3 tiers)	Individual	Licensure Database
	Raw score on NM teacher assessment	Individual	Licensure Database

*Counts and Ratios.* Staff counts and ratios can be calculated from individual data in the Accountability Data System (see Table NM5). Staff full-time equivalency (FTE) counts can be created by position, school, district, or demographic characteristics. Researchers can calculate a pupil:teacher ratio using student enrollment information and an aggregate of classroom teachers listed in the Accountability Data System. State data do not contain actual class size information. However, course information, including the student identifier, teacher identifier, and course number, are collected in the Accountability Data System; researchers might potentially be able to estimate class size using this information. Other staff ratios such as teacher:administrator or pupil:administrator also can be calculated using aggregated staff full-time equivalency (FTE) counts from the Accountability Data System.

Table NM5

*Student and Staff Counts and Ratios, New Mexico*

Count/Ratio Measure	Data Available	Unit of Analysis	Source
Student enrollment	Can be calculated from existing data	Grade Program School District Demographic subgroups	Accountability Data System
Staff full-time equivalency counts	Can be calculated from existing data	Job position School District Demographic subgroups	Accountability Data System
Class size	Possibility of calculating actual class size from existing data	Class	Accountability Data System
Other ratios: • Pupil:teacher • Pupil:administrator • Teacher:administrator	Can be calculated from existing data	School District	Accountability Data System

*Data Usability.* As summarized in Table NM6, data on staff characteristics are useful in many ways for policy research purposes and also contain some limitations for these purposes. These data are collected on an individual level, creating flexibility for researchers to create aggregated data on a number of subgroup categories such as grade, school, and demographic characteristics and to create student and staff ratios for schools and districts. The structure of the database includes a way to link individual students to their teachers for each class in which they are enrolled. The Accountability Data System has been in existence for many years and has established automated data collection, validation, and error correction mechanisms. Since staff data contain job code information, teacher data can be isolated for research purposes.

The most important data usability issue concerns accessibility of individual-level staff data for use by outside researchers. State and district summaries of staff information are available on the New Mexico Public Education Department Web site; however, these data are not downloadable and postings are not consistent with respect to content and timeliness. Also, no established mechanism exists for sharing individual-level data with outside users, and data managers struggle with federal Family Educational Rights and Privacy Act (FERPA) requirements because the unique identifier for staff in the Accountability Data System database is the individual's Social Security number.

Another concern regarding data usability is the fact that teacher certification data are compiled from a different source using different procedures than the Accountability Data System. Data on the same individuals originate from two streams of data collection using different procedures, which creates greater possibility of misaligned data on teachers. Additionally, certification data are collected using a cumulative process in which updates are made to teacher information without annual archives. Because this database does not contain the

issue date or end date of teacher certificates, researchers face a significant barrier to conducting analysis on this variable.

Table NM6

*Strengths and Challenges of Staff Data That Affect Their Use for Policy Research, New Mexico*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Individual-level staff characteristics are collected with the ability to aggregate data up to grade, school, or district levels.</li> <li>Data documentation is updated annually and available by request from the New Mexico Public Education Department.</li> </ul>	<ul style="list-style-type: none"> <li>Staff data are not publicly available and must be obtained by special request from the New Mexico Public Education Department staff.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>Three data collection periods ensure that most students and staff are accounted for given partial-year staff contracts and within-year staff and student turnover.</li> <li>Staff data are collected for certified and noncertified staff for all schools and all years of the study period.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher certification data lack critical information about dates for which certifications are valid.</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>Automatic error checking is conducted before districts formally submit data to the New Mexico Public Education Department.</li> </ul>	<ul style="list-style-type: none"> <li>Accuracy of certain variables of interest are suspect (e.g., staff years of experience, student poverty).</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>No substantive changes were made in data collection procedures or variable definitions during the study period.</li> <li>Data collection documentation provides clear instructions with helpful examples for the user.</li> </ul>	
Alignment	<ul style="list-style-type: none"> <li>Staff characteristics can be linked to salary data.</li> <li>Individual students can be linked to their teachers for each class in which they are enrolled.</li> <li>Teacher certification data are regularly uploaded to the main staff database.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher data are a combination of two data collection efforts, staff characteristics and teacher certification, creating the possibility of misalignment if data are merged.</li> <li>The teacher certification database is updated cumulatively without year-to-year archive information for aligning with other staff data.</li> </ul>

### *Student Performance*

The state of New Mexico uses multiple student achievement tests for measuring performance: norm-referenced tests in English and Spanish, a 10th-grade competency exam, and a state writing assessment. Student performance is also gauged at the school level using school accountability rankings that are based primarily on test scores.

*Norm- and Criterion-Referenced Tests.* New Mexico has traditionally relied on norm-referenced student achievement tests to track performance of students. The CTBS/TerraNova Survey Plus was used through 2001–2002 for grades 3–9. The state reported median percentiles for math, reading, language arts, total score, science, and social studies. The state also reported scale scores for criterion-referenced questions that were identified within the norm-referenced exams in math, language arts, science, and social studies. The CTBS/Terra Nova Survey Plus was replaced in 2002 by the Terra Nova 2<sup>nd</sup> edition Complete Battery (CAT) for grades 3–9. The state reported median percentiles for math, reading, language arts, total score, science, and social studies. A true criterion-referenced exam was introduced in December 2003 for grades 4 and 8. By 2005, the state plans to replace the norm-referenced exam with a criterion-referenced exam for grades 3–9 and 11.

*New Mexico Writing Assessment Score.* A one-hour writing exercise is given to students in grades 4 and 6 (optional in grade 8). Tests are scored on a range from 1 to 6.

*New Mexico High School Competency Exam.* Students in grade 10 are tested for their competency in reading, language arts, math, science, social studies, and written composition. Results are recorded as a scale score and percentage passing for each subject category. A passing score is required for a high school diploma.

*State Accountability Ranking.* Each school is ranked based on test scores, number of dropouts, student attendance, safety plan, and parent involvement plan. Four accountability rankings are used by the state (exemplary, meets standards, probationary, corrective action). Districts are currently not ranked by the accountability system.

Table NM7

*Student Performance Tests, New Mexico*

Test	Type	Scoring	Grades	Subject Areas	Notes
Terra Nova Survey Plus	Norm-referenced test	Percentile rank Normal curve equivalent Scale	3–9	Math, reading, language arts, total score, science, social studies	Administered through 2001–2002. Spanish Terra Nova was instituted 2000–2001 and includes two different tests from which districts could choose.
Terra Nova 2 <sup>nd</sup> edition	Norm-referenced test	Percentile rank Normal curve equivalent Scale	3–9	Math, reading, language arts, total score, science, social studies	Replaced the Survey Plus in 2002–2003. Scores were ranked using Survey Plus norms.
High School Competency Exam	Exit exam	Pass–fail Scale	10	Reading, language arts, math, science, social studies	Required for diploma. Spanish exit exam began in 2000–2001.
New Mexico Writing Assessment	Written exam	Holistic score from 1 to 6	4, 6, 8 (optional)	Writing	
New Mexico Criterion- Referenced Test	Criterion- referenced test		4, 8		The criterion-referenced test was piloted in two grades in 2003–04. The state plans to replace the norm-referenced test with a criterion- referenced test (grades 3–9, 11) by 2005.

*Data Usability Issues.* Student performance testing in New Mexico has stayed relatively consistent over time and has been used for multiple grades (3–10) for all years considered in this study (1999–2003). These data enable researchers to track the performance of an individual

student from year to year. These features are highly advantageous for researchers interested in longitudinal analysis of resources and the performance of student cohort groups. The state's commitment to including a Spanish version of their standardized test (beginning in 2000–2001) provides an opportunity to conduct focused analysis on limited English proficient (LEP) students. The most obvious concerns relate to accessibility of these data by the research community. State summaries of student performance are published on the New Mexico Public Education Department Web site, but more detailed test data are not publicly available. When requesting student performance data from the agency, researchers faced similar challenges presented in accessing Accountability Data System student and staff data (no established mechanism for sharing individual-level data with outside users). Changes in testing in the state will affect future longitudinal analysis because norm-referenced tests will be replaced by criterion-referenced tests in 2005. Finally, state accountability rankings provide composite scores for each school in the state that reflect state performance priorities. However, rankings are clustered in the middle two categories and provide very little variability for use in statistical analysis.

Table NM8

*Strengths and Challenges of Student Performance Data That Affect Their Use for Policy Research, New Mexico*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>• Student performance results in multiple score formats (NCE, percentile rank, scale) can be requested by grade level from the New Mexico Public Education Department.</li> </ul>	<ul style="list-style-type: none"> <li>• Agency staff have no procedure in place to provide outside users with individual- or grade-level student performance data.</li> <li>• Student performance data are not downloadable from the New Mexico Public Education Department Web site.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>• Student performance data can be requested on all test takers and also on subgroups (high-poverty, high-minority, special education, limited English proficient).</li> <li>• Test scores are available for a wide span of grades (3–9 Terra Nova).</li> </ul>	<ul style="list-style-type: none"> <li>• The universe of test takers has expanded with the introduction of the Spanish Terra Nova in 2000–2001.</li> </ul>
Accuracy		<ul style="list-style-type: none"> <li>• Demographic data attached to student performance scores are unreliable due to self-report error; researchers must request additional data cross-referenced with the Accountability Data System.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>• Terra Nova testing provides a consistent span of test years and grades tested.</li> </ul>	<ul style="list-style-type: none"> <li>• The testing changed from Terra Nova Survey Plus to Terra Nova 2<sup>nd</sup> edition in 2002 (norming standard did not change).</li> <li>• New Mexico criterion-referenced test was piloted in 2003 and is due to replace the Terra Nova by 2005.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>• Demographic and programmatic information about test takers can be matched with test results.</li> </ul>	

*Student, School, and District Characteristics*

*Student Characteristics.* New Mexico school districts compile information on individual students and report these data to the state via the Accountability Data System. Similar to staff data, student data are reported on the 40th, 80th, and 120th days of the school year. Additional reporting dates for students are December 1 and the end of the school year. Student

characteristics that are contained in the Accountability Data System and of interest for this study are listed in Table NM9.

Table NM9

*Data Available in State Education Databases on Student Characteristics, New Mexico*

Student Characteristic	Variables Available	Source	Unit of Analysis
Socioeconomic status	Free and reduced-price lunch program participation	Accountability Data System	Individual
Race/ethnicity	Ethnicity Tribe	Accountability Data System	Individual
Grade	Grade	Accountability Data System	Individual
Gender	Gender	Accountability Data System	Individual
Program participation	Special education Bilingual/English as a second language Limited English proficient/English language learner Title IA, IC, III, VIII, VII Johnson-O'Malley Act Perkins tech-prep	Accountability Data System	Individual
Other	Home language	Accountability Data System	Individual

*School and District Characteristics.* Student characteristics can be aggregated to the school and district levels, creating important demographic characteristics. These measures can also be requested from the New Mexico Public Education Department in lieu of individual-level data. School and district characteristics of interest to policy researchers are listed in Table NM10 with a short description of data sources for each. School locale code is not available in any state education database, and per-pupil expenditures cannot be determined at the school level because expenditure data are collected only at the district level. A limited number of district characteristics are posted to the agency's Web site. However, these data are in portable document format (.pdf) and therefore are not readily usable for analysis purposes. District wealth can be

measured as the sum of residential, nonresidential, and oil/gas/copper values in the district, the district tax rate, or revenues available from local taxes (including residential, nonresidential, and oil/gas taxes). These district wealth measures can be downloaded from the New Mexico Public Education Department Web site for 2000 through 2003.

Table NM10

*Data Sources for School and District Characteristics, New Mexico*

Characteristic	Source	
	School	District
School type	Special request to the New Mexico Public Education Department	N/A
Enrollment	Special request to the New Mexico Public Education Department or aggregate from student data	
Locale	U.S. Census Bureau 2000 Census	
Attendance rate	Special request to the New Mexico Public Education Department	
Dropout rate	Special request to the New Mexico Public Education Department	
Per pupil expenditures	N/A	Calculation of expenditure and student enrollment data
Average class size	Special request to the New Mexico Public Education Department or aggregate from student and staff data	New Mexico Public Education Department Web site or aggregate from student and staff data
Number of teachers	Special request to the New Mexico Public Education Department or aggregate from staff data	New Mexico Public Education Department Web site or aggregate from staff data
Accountability rating	New Mexico Public Education Department Web site	N/A
District wealth	N/A	New Mexico Public Education Department Web site

*Community Characteristics.* Education databases do not contain information about characteristics of the community within which a school or district is located. Census information provides a number of relevant indicators for community well-being, including family income, parent education levels, and receipt of public assistance.

*Data Usability Issues.* The quality of school and district characteristics is heavily dependent on the quality of their source data—student and staff data in the Accountability Data System (ADS) database. The New Mexico Public Education Department provides district characteristics on its Web site; however, only district financial characteristics can be downloaded for use in a research study. Also, data managers at the agency explained that the measure for poverty status of students is unreliable due to inconsistent reporting procedures. These data were only collected through the Accountability Data System during the 1998–1999 school year. A second source of data on students’ free and reduced-price lunch program participation are data that are submitted with student achievement test reports. These data are also suspect due to self-report error.

#### *Summary of Findings*

*Alignment.* According to data managers at the state department of education, characteristics of individual students and teachers could be matched by aligning students to the unique course number that can also be aligned to individual teachers. Student characteristics could also be matched to their performance scores by matching student Social Security numbers from the Accountability Data System and test score datasets. Although data managers described this process as a way to align teachers and students at an individual level, they also expressed that confidentiality issues would likely create a barrier for researchers to actually obtain these data and test whether such alignment is possible (Social Security numbers are used as unique identifiers for both teachers and students).

With regard to aligning data on fiscal resources, staff salary information is collected on an individual level in the Accountability Data System and could be aggregated to the school and

district level. However, other fiscal data (e.g., expenditures for staff benefits, materials, equipment, travel, training) are only available at the district level.

The certification database presents a barrier for researchers because data are continuously updated without annual archiving. This process, along with lack of issue dates and expiration dates, results in the inability to create a subset of active, certified staff for a given study period.

*Accessibility.* At the time of this analysis, the New Mexico Public Education Department was undergoing a major restructuring. Voters approved a new governance structure in September 2003 that eliminated existing leadership at the department. This environment contributed to major changes in staffing at all levels of the department; at the time of this study, approximately 40 of the agency's positions were unfilled. Access to data was severely limited during this time as few staff persons were in positions to approve outside requests for individual-level data. This situation created a serious barrier to the data collection process for this study.

*Usability.* Based on documentation of existing data and conversations with data managers at the state department of education, researchers found a sufficient range of data describing resources; student performance; and student, school, and district characteristics. Student and teacher characteristics are collected by the state at the individual level, creating the potential for more complex analysis and the flexibility for aggregating these data to higher levels for research purposes.

## **Appendix E**

### **Texas State Education Data**

The state of Texas oversees education services to more than 4.2 million children and employs more than 300,000 teachers and other professional staff in 7,733 schools and 1,039 districts. Annual education expenditures in the state top \$30 billion. As one of the largest state education systems in the country, data collection and management have been of great importance to Texas and have resulted in education data resources used by state and national researchers and policy analysts.

#### *Overview of Existing State Data*

The Public Education Information Management System (PEIMS) encompasses all data requested and received by the Texas Education Agency about public education, including student demographic and academic performance, personnel, financial, and organizational information. According to Texas Education Agency documents, the Public Education Information Management System “is believed to be the world’s largest repository of educational data.” The Public Education Information Management System contains data necessary for the legislature and the Texas Education Agency to perform their legally authorized functions in overseeing public education. School districts submit their data to the Public Education Information Management System in a standardized electronic format. State education agency data managers also create calculated data elements derived from district submissions. Two data systems that are closely linked to the Public Education Information Management System are the Financial Accountability System and the Academic Excellence Indicator System (AEIS).

The Financial Accountability System manages the collection and reporting of financial data from Texas school districts. This system helps school districts maintain budgeting and

financial accounting and reporting systems required by the state. It also specifies principles and policies that were developed by the state to ensure uniformity in accounting. Financial data are organized into account codes at function, object, and program levels. Data are reported through the Public Education Information Management System reporting process. An online resource guide available to the public provides guidelines for district data management staff in collecting and managing financial information for the Public Education Information Management System (<http://www.tea.state.tx.us/school.finance/audit/resguide10/index.html>). The resource guide also contains a list and definitions of account codes (funds, functions, objects, programs) by which financial data are organized.

The Academic Excellence Indicator System compiles a wide range of Public Education Information Management System data on students, staff, and characteristics of each school and district in Texas. This information is put into annual Academic Excellence Indicator System reports, which are available in the fall. Academic Excellence Indicator System data are also available for download from the Texas Education Agency's Web site (<http://www.tea.state.tx.us/perfreport/aeis/>). These data include student performance indicators, student and staff demographics, staff counts, and financial summaries. The Academic Excellence Indicator System glossary describes each data item and provides the methodology and data sources for calculated values. The glossary is updated annually and can be accessed online in either English or Spanish at <http://www.tea.state.tx.us/perfreport/aeis/2003/glossary.html>.

In addition to the Public Education Information Management System, the State Board for Educator Certification (SBEC) database contains information of interest to resource allocation researchers. The State Board for Educator Certification is responsible for ensuring that educators are qualified to serve in the Texas public school system. The agency issues certification

credentials to qualified applicants and also manages the development and administration of teacher competency exams. As part of their work, State Board for Educator Certification staff collect and report on data about Texas teachers, including certification information and teacher test scores. The agency's interactive Web tool allows public users to search for information about teacher certification and teacher preparation institutions at <http://www.sbec.state.tx.us/reports/default.asp>.

Table TX1

*Summary of Existing State Databases, Texas*

Data Category	State Database	Managing Agency/Department
Instructional expenditures	Public Education Information Management System (PEIMS) Academic Excellence Indicator System (AEIS)	Texas Education Agency, School Finance and Fiscal Analysis Division
Staff characteristics	Public Education Information Management System (PEIMS) Academic Excellence Indicator System (AEIS)	Texas Education Agency, Public Education Information Management System Division
Student characteristics	Public Education Information Management System (PEIMS) Academic Excellence Indicator System (AEIS)	Texas Education Agency, Public Education Information Management System Division
Student performance	Public Education Information Management System (PEIMS) Academic Excellence Indicator System (AEIS)	Texas Education Agency, Student Assessment Division
Teacher licensure	State Board for Educator Certification (SBEC) database	State Board for Educator Certification

*Instructional Spending*

Instructional spending is tracked by school districts and organized into a standard accounting structure established by the Financial Accountability System. Information related to staff salaries is collected through the Public Education Information Management System data

collection for individual staff persons and integrated into the financial accounting structure.

Descriptions of the instructional spending variables available through state education databases appear in Table TX2 and are discussed below.

Table TX2

*Measures of Instructional Expenditures From District Financial Data, Texas*

Fiscal Measure	Variables Available	Description	Unit of Analysis
Instruction-related expenditure functions and subfunctions	Instruction and instruction-related services	This large function is composed of three subfunctions:  1. Instruction: Expenditures for activities that deal directly with the interaction between teachers and students  2. Instructional resources and media support: Expenditures that are directly and exclusively used for establishing and maintaining libraries and other major facilities dealing with educational resources and media  3. Curriculum development and instructional staff development: Expenditures that are directly and exclusively used to aid instructional staff in planning, developing, and evaluating the process of providing learning experiences for students	District School Program
	Instructional and school leadership	Expenditures that relate to the managing, directing, supervising, and leadership of staff who are providing either instructional or instructional-related services	District School Program
	Support services—student	Expenditures that are used directly for noninstructional student activities or services. Subfunctions related to this function include guidance, counseling, and evaluation services; social work services; health services; student transportation; food services; and cocurricular/extracurricular activities.	District School Program
	Administrative support services	Expenditures that are for the purposes of managing or governing the school district as an overall entity. This function is primarily composed of the subfunction general administration.	District School Program

Instruction-related expenditure objects	Payroll costs—teachers and other professional personnel	Gross salaries or wages paid to persons who are considered by the school district to be a professional staff member	District School Program
	Payroll costs—support personnel	Gross salaries or wages paid to support personnel	District School Program
	Payroll costs—employee allowances	Expenditures paid to employees for which the employee is not required to render a detailed accounting, such as contract buyouts; \$1,000 Texas Retirement System supplemental compensation; and automobile, housing, and other allowances	District School Program
	Payroll costs—employee benefits	Expenditures paid by the school district to provide benefits to employees such as federal Social Security payments, insurance, workers’ compensation, retirement, and unemployment compensation	District School Program
	Professional and contracted services	Expenditures for services rendered to the school district by firms, individuals, and other organizations, including professional services, tuition and transfer payments, education service center services, contracted maintenance and repair, utilities, and rentals	District School Program
	Supplies and materials	Expenditures for supplies and materials, including supplies and materials for maintenance and operations; textbooks and other reading materials; testing materials; and food service	District School Program
	Other operating costs	Expenditures for miscellaneous operating costs such as travel subsistence and stipends; insurance and bonding; elections; and depreciation of trust funds	District School Program
	Debt service	Expenditures for debt service including principal, interest, and other payments	District School Program
	Capital outlay—land, buildings, and equipment	Expenditures for capital assets, including land purchase and improvement; building purchase, construction, or improvement; furniture and equipment purchases of \$5,000 or more; and capital assets of less than \$5,000	District School Program
Staff salary data	Payroll amount	The annual pay that a staff person is scheduled to receive. This amount is composed of a base pay for regular duties and supplemental pay for noninstructional activities such as coaching or tutoring. The payroll amount is associated with function, object, and program fiscal categories.	Individual

*Instructional Expenditures.* Instructional expenditures are divided into four functions covering four broad areas of spending: (a) instruction and instruction-related services, (b) instructional and school leadership, (c) support services—student, and (d) administrative support services. These four functions are divided into subfunctions that provide more detailed accounting of spending within the larger categories. For each function and subfunction, expenditures are divided into payroll costs; professional and contracted services; supplies and materials; other operating costs; debt service; and capital outlay—land, buildings, and equipment.

Fiscal data are available at the district level and at the organizational level. Organizations include alternative schools, high schools, junior high/middle schools, elementary schools, and summer schools. Fiscal data are also organized by a range of program areas that include basic educational services and enhanced services (gifted and talented education, bilingual programs, etc.).

*Salaries and Benefits.* Salary data are collected through the Public Education Information Management System and are reported in the following multiple formats:

1. The Public Education Information Management System collects individual-level salaries for professional, paraprofessional, and auxiliary staff organized under more than 40 role categories (principal, teacher, education aide, etc.). These data are the basis for aggregate salary data reported in the Academic Excellence Indicator System and the Financial Accountability System.

2. Average actual salaries are compiled from Public Education Information Management System data and reported for each school through the Academic Excellence

Indicator System. The Academic Excellence Indicator System also reports average teacher salary by years of experience for each school.

3. Salary information from the Public Education Information Management System is also aggregated to the school and district levels for groups of instructional staff in the Financial Accountability System. Salary data for related staff role categories are combined and reported as object-level gross salaries or wages under several function categories. Grouping of staff salaries allows researchers access to salary information that is aligned with fiscal function categories; however, the staff groupings are large enough to limit researchers' ability to isolate the salary paid to any specific category of staff (e.g., classroom teachers). Under the instruction function, for example, the salary object represents combined expenditures to teachers, teacher aides, classroom assistants, graders, staff working in the classroom on a dedicated basis, adult basic education teachers, substitute teachers, and remote teachers.

Two object codes in the financial data relate to staff benefits. The employee allowance object includes contract buyouts, a \$1,000 Teacher Retirement System supplemental compensation, and employee allowances. The employee benefits object includes the traditional range of employee benefits (health insurance, Social Security, workers' compensation, etc.).

*Data Usability.* Table TX3 contains a summary of the usability characteristics that researchers identified regarding instructional expenditure data. Researchers found that fiscal and salary data are easily accessible and reliable for conducting research. The Texas Education Agency's Web site contains an extensive collection of data organized by school and district. These data can be searched for individual schools or districts and are also easily downloadable in multiple computer formats. Documentation of these data is also readily available and contains detailed information about the data collection process and variable definitions. Salary and

expenditure data were collected in a relatively consistent manner during the study period (1999–2003), and data managers reported only minor changes to data that might affect their accuracy. Another important strength in this state’s expenditure and salary data is the internal consistency of these data. Staff salary information in the Public Education Information Management System and fiscal expenditure data on salaries are both recorded by function, object, and program and therefore represent consistent dollar amounts. These data also have the potential to allow researchers to align salary and expenditure data with a wide range of other data such as staff characteristics, teacher certification, student performance, and school and district characteristics.

The Texas Education Agency uses a standardized procedure that checks for errors in data submitted by school districts and has a feedback mechanism that allows districts to correct mistakes or inconsistencies. Education Service Centers in the state use an automated system (EDIT+) to validate data before they allow districts to submit them to the state Public Education Information Management System database. Although EDIT+ can detect major errors and discrepancies in data prepared by school districts, it cannot identify or correct content errors or other less pervasive problems in data collection and reporting. Education Service Centers also are charged by the state to support data quality by providing training and assisting school districts with their data submissions.

Researchers encountered the following challenges associated with applying instructional expenditure and salary data to research efforts:

1. Accessibility of these data is hampered by their relative complexity. A user would need to spend a significant amount of time learning the structure of these data and the definitions of variables and how they relate to one another. For example, how individual staff salaries are

aggregated to create the object-level salaries in the fiscal database is neither explicit in the documentation nor implicit in the way these data are organized.

2. Although state data managers have a well-defined process for responding to requests for data that are not available via public sources, outside users must pay a fee to obtain such data and must wait 6–8 weeks or longer for the data request to be processed.

3. Researchers face a challenge in computing the total amount spent for staff compensation because data are not available to measure the amount spent on benefits for individual staff.

4. Although each individual staff salary is assigned a function, object, and program expenditure category for cross-referencing to the fiscal database, there is no standardized range of staff position codes aggregated within each function category. For example, districts could report the salary of an instructional officer into the fiscal expenditure function curriculum development and instructional staff development or into the function instructional and school leadership.

Table TX3

*Strengths and Challenges of Instructional Expenditure Data That Affect Their Use for Policy Research, Texas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Data are available from two sources: district expenditure and individual staff salaries.</li> <li>School- and district-level expenditure and salary data are publicly available from the Texas Education Agency's Web site.</li> <li>Annually updated data documentation is also available on the Texas Education Agency's Web site.</li> </ul>	<ul style="list-style-type: none"> <li>Data systems are large and of significant complexity.</li> <li>To obtain individual staff salary data researchers must submit a special request to Texas Education Agency, wait for the request to be processed, and pay a fee.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>Financial data are disaggregated to the district, school, and program levels and are available for all years of the study period.</li> <li>Staff salary data are collected for all classified and certified staff and for all years of the study period.</li> </ul>	
Accuracy	<ul style="list-style-type: none"> <li>The financial data collection process is well-established and has undergone minimal changes over the study period, increasing the accuracy of district reporting.</li> <li>Editing and data validation is conducted by regional service centers before districts submit final data reports to the Texas Education Agency.</li> </ul>	<ul style="list-style-type: none"> <li>Some data collection problems persist, especially for districts that encounter changes in leadership or accounting staff.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>No substantive changes were made in data collection procedures or variable definitions during the study period.</li> <li>Individual salary data are assigned function, object, and program labels that are consistent with fiscal data categories.</li> </ul>	
Alignment	<ul style="list-style-type: none"> <li>Individual staff salary data can be aligned with other staff characteristics.</li> <li>Staff salary data can be averaged across grades, schools, and districts.</li> </ul>	<ul style="list-style-type: none"> <li>Staff salaries are aggregated to function categories using role codes. Since role codes are assigned at the discretion of each district, there is no standard list of role codes aggregated into each function category.</li> <li>Staff benefits are collected at the district level only. Individual-level expenditures for benefits can only be estimated by averaging across all staff in a district.</li> </ul>

### *Staff Characteristics*

Information on staff characteristics is collected through the Public Education Information Management System. A wide range of staff characteristics and job-related information is collected for education staff. Basic demographic information and payroll information are collected for all staff, including nonprofessional auxiliary staff such as cafeteria workers, secretaries, and bus drivers. These variables include a district identification code, ethnicity, gender, years of experience, highest degree obtained, and payroll amount. Data on professional and paraprofessional staff also contain information about staff responsibilities such as the subject area taught, the specific position(s) held, and percentage of their full-time equivalency (FTE) allocated to multiple positions. These data are organized so that by identifying the role categories that correspond with the staff category of interest, researchers can identify a range of characteristics for individuals within these role categories. Classroom teachers, for example, can be defined with three role codes: (a) teachers, (b) special duty teachers, and (c) permanent substitutes. Staff in specific roles can be counted, combined, or matched to other characteristics such as demographics, salary, education level, or certification.

Additional teacher information is available from the State Board of Educator Certification. This state agency collects certification and teacher test data on all teachers, including educator preparation institution, route to certification, type of certification, grade and subject area of certification, and raw score on teacher competency tests (pedagogy and content areas). This agency also compiles teacher data into reports and downloadable compilations of school and district data.

Table TX4

*Staff Characteristics Available in State Databases, Texas*

Staff Characteristic	Variables Available	Unit of Analysis	Source
Position and full-time equivalency (FTE)	Position of staff person and full-time equivalency devoted to each position the individual fills	Individual	Public Education Information Management System
Experience	Years of experience in the profession	Individual	Public Education Information Management System
Education	Highest degree earned	Individual	Public Education Information Management System
	Bachelor's degree institution	Individual	State Board for Educator Certification
Demographics	Gender	Individual	Public Education Information Management System
	Race/ethnicity	Individual	Public Education Information Management System
Certification (teachers)	Subject area of license	Individual	State Board for Educator Certification
	Grade level of license	Individual	State Board for Educator Certification
	Type of license (standard, waiver, emergency, etc.)	Individual	State Board for Educator Certification
	Route to certification (standard, alternative)	Individual	State Board for Educator Certification
	Effective date of license	Individual	State Board for Educator Certification
	Raw score on teacher assessment	Individual	State Board for Educator Certification
	Special permit	Individual	Public Education Information Management System

*Staff Counts and Ratios.* Existing staff data enable researchers to use two obvious methods for determining staff counts and calculating ratios such as teacher:pupil, administrator:teacher, and administrator:pupil.

The Academic Excellence Indicator System school- and district-level staff counts and student membership counts can be used to determine staff ratios. The Academic Excellence Indicator System contains full-time equivalency counts of school/district administrators, educational aides, professional support staff, teachers, and students in each school. The limitation of this approach is that the lowest level of aggregation possible is the school level. Also, the staff counts in this database are combinations of different categories of staff. For example, the school administrator count combines seven staff categories from principal to athletic director.

The Public Education Information Management System data allow greater flexibility in calculating staff ratios. Full-time equivalency counts of particular types of staff (teachers, educational aides, principals, psychologists, librarians, etc.) could be aggregated from this information to the school and district levels.

Understanding that a school-level calculation of the teacher:pupil ratio is not an accurate representation of class size, data users can consider another measure from the Academic Excellence Indicator System data called Class Size Average. Although these data are not a true measure of class size and still rely on a pupil:teacher ratio, they are compiled by grade for elementary schools and by selected subjects for secondary schools. For elementary schools, teacher full-time equivalency counts in each grade level and the number of students per grade are used to derive a class size average. For secondary schools, each unique combination of teacher and class time is counted as a class, and an average is determined by summing the number of students served and dividing that figure by a calculated count of the number of classes in a subject.

Table TX5

*Student and Staff Counts and Ratios, Texas*

Count/Ratio Measure	Data Available	Unit of Analysis	Source
Staff full-time equivalency counts	Can be calculated from existing data	By position Grade School District Demographic subgroups	Academic Excellence Indicator System and Public Education Information Management System
Class size	Average class size variable computed (with different computations for elementary and secondary grades)	Grade School District	Academic Excellence Indicator System
Other ratios: • Pupil:teacher • Pupil:administrator • Teacher:administrator	Can be calculated from existing data	Grade (teachers) School District	Academic Excellence Indicator System and Public Education Information Management System

*Data Usability.* Staff and teacher data available in Texas are comprehensive and complex. The Public Education Information Management System collects information on all education employees in the state at an individual level, and these data can be used to create grade, school, or district averages. The Texas Education Agency also compiles staff data at these levels of aggregation through the Academic Excellence Indicator System database. The accessibility of these data is high due to the vast amounts of data on schools and districts that it contains in report format or for download from the Texas Education Agency. Documentation on data from that agency is readily available from its Web site. A strength of the Public Education Information Management System data is the error-checking mechanism that was described in the discussion on instructional expenditures. Also contributing to the consistency of these data are the clear and detailed reporting instructions the state provides to reporting districts. The state has changed or added few variables over the past 5 years. Since data are collected for individual staff

and relevant grade, school, or district labels are attached to these data, they provide great potential for aligning to student performance data, student characteristics, and school and district characteristics.

The Texas staff characteristics data also present a number of challenges for their application to policy research. The complexity of the staff data in the Public Education Information Management System database is relatively high. Understanding, for example, how a teacher with multiple roles and teaching responsibilities would be recorded requires careful study of the data documentation. Additionally, data documentation on teacher certification does not currently exist, and researchers must rely on conversations with data managers to fully understand what variables are available and their definitions. The accuracy of certain staff data variables is suspect. Data managers have explained that districts often apply the wrong instructions when recording years of experience, especially for teachers that transfer between districts. The State Board for Educator Certification estimates the number of in-field teachers in Texas schools; however, this aggregated measure is not available at an individual-teacher level and its validity is suspect given that the state does not collect information on teachers' degree major. Data on teacher characteristics required two separate requests to two separate agencies. School-level teacher characteristic data are available for download from the state education agency, and researchers can also request data from that agency to obtain individual-level data. Additional teacher variables housed at the State Board for Educator Certification must be requested from that agency. Coordinated efforts are needed in order for researchers to align data sets on staff from these two agencies, so both agencies use an identical scrambling algorithm for teachers' Social Security numbers. Additionally, licensure data are collected using a cumulative process in which updates are made to teacher information without annual archives. Researchers

must rely on the certification issue date and expiration date for each individual in order to create a subset of active, certified staff for a given study period.

Table TX6

*Strengths and Challenges of Staff Data That Affect Their Use for Policy Research, Texas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>Individual-level staff characteristics are collected with ability to aggregate data up to grade, school, or district levels.</li> <li>Public Education Information Management System and Academic Excellence Indicator System data documentation are updated annually and available on the Texas Education Agency's Web site.</li> </ul>	<ul style="list-style-type: none"> <li>Data systems are large and relatively complex.</li> <li>To obtain individual staff data researchers must submit a special request to the Texas Education Agency, wait for the request to be processed, and pay a fee.</li> <li>No documentation exists on data contained in State Board for Educator Certification databases.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>Information is collected for all employees.</li> </ul>	<ul style="list-style-type: none"> <li>Information about auxiliary staff is limited to demographic and payroll information; therefore, professional staff that also hold auxiliary positions would not have complete information about full-time equivalency of their position.</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>Automatic error checking is conducted before data are submitted to the state.</li> </ul>	<ul style="list-style-type: none"> <li>Accuracy of certain variables of interest are suspect (e.g., staff years of experience).</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>Few substantive changes were made in Public Education Information Management System data collection procedures or variable definitions during the study period.</li> <li>Public Education Information Management System data collection documentation provide clear instructions with helpful examples for the user.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher test scores have changed over time and were not required prior to 1986.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>Staff characteristics (including salaries) can be aligned with teacher certification at the individual level and student performance and characteristics at the grade, school, or district levels.</li> </ul>	<ul style="list-style-type: none"> <li>Staff characteristics from the Public Education Information Management System and teacher certification data from the State Board for Educator Certification are housed in different agencies, and researchers need to coordinate between them to get aligned data on teachers.</li> <li>The cumulative process used to keep the licensure data updated create the potential for misaligned data.</li> </ul>

### *Student Performance Data*

*Criterion-Referenced Tests.* Although the state of Texas has had statewide testing of its students since 1979, the performance tests most relevant for current research purposes are the Texas Assessment of Academic Skills (TAAS) and the Texas Assessment of Knowledge and Skills (TAKS).

The Texas Assessment of Academic Skills was instituted in 1990 and has undergone some expansion and modification since that year. Most significantly for consideration by researchers is that in 1993–1994 the state began testing grades 3–9 (from 3, 5, 7, and 9) and moved the exit-level test from grade 11 to grade 10. Also during this time, the state accountability system began rating schools and districts, releasing tests results to the public, and requiring passage of the exit-level test for graduation. New passing standards were instituted in 1994 that allowed a new measure, the Texas Learning Index (TLI), to compare achievement across grades. The Texas Assessment of Academic Skills was retired after the 2002 administration and replaced with the Texas Assessment of Knowledge and Skills. Texas Assessment of Knowledge and Skills is a criterion-referenced exam like the Texas Assessment of Academic Skills but was developed to align to new performance standards (Texas Essential Knowledge and Skills). Texas Assessment of Knowledge and Skills tests are administered to grades 3–11, and results will be used to determine retention of students in grades 3, 5, and 8 and graduation of students at the grade 11 administration.

Student test results are reported in a variety of formats (percentage passing, scale score, Texas Learning Index score). The Texas Education Agency also provides guidelines for conversions such as Texas Learning Index score to percentile rank or normal curve equivalent. School- and district-level test results are readily available and downloadable from the Texas

Education Agency's Web site through the Academic Excellence Indicator System. Researchers can also request individual-level test scores from the agency. The Texas Education Agency will release individual-level data stripped of identifiers and excluding subgroups smaller than five.

*State Accountability Ranking.* State statute requires annual district performance ratings with the standard accountability labels of exemplary, recognized, academically acceptable, and academically unacceptable. These labels have been determined primarily by student performance on state tests and dropout rates. Additional criteria will be added for determining the 2004 rating.

Relevant for use of these rankings by researchers is the fact that since 2 years of test data are used to calculate the improvement portion of the ranking and the state transitioned from the Texas Assessment of Academic Skills to the Texas Assessment of Knowledge and Skills in 2002–2003, rankings for 2003–2004 will not be determined, but the state will carry forward the rankings determined for 2002–2003.

Table TX7

*Student Performance Tests, Texas*

Test	Type	Scoring	Grades	Subject Areas	Notes
Texas Assessment of Academic Skills	Criterion-referenced	Raw score, scale score, Texas Learning Index	3–8, 10th grade exit	Math, reading, writing, science, social studies	Administered in the spring from 1990–2002. A Spanish version of the exam was benchmarked beginning 1996.
End-of-course exams	End of course		Upon course completion	Algebra, biology, English, U.S. history	Option for meeting graduation requirements in 1995; ended administration in 2002
Texas Assessment of Knowledge and Skills	Criterion-referenced		3–11		First administered in the spring of 2003. Replaced the Texas Assessment of Academic Skills and end-of-course exams

*Data Usability Issues.* Student performance information for Texas is available for a wide range of grades and over a long span of years. Statewide testing in a state as large as Texas also ensures that more than three million student test scores are available for research purposes each year. Data are reported by the Texas Education Agency in the form of Web reports and downloadable data down to the school level. One weakness in data usability that has arisen very recently is the transition from the Texas Assessment of Academic Skills to the Texas Assessment of Knowledge and Skills. Unless a workable conversion is made available to help equate Texas Assessment of Academic Skills and Texas Assessment of Knowledge and Skills scores, researchers are challenged to bridge the 2002–2003 and 2003–2004 test years in any longitudinal analysis.

Table TX8

*Strengths and Challenges of Student Performance Data That Affect Their Use for Policy Research, Texas*

Criterion	Strengths	Challenges
Availability and accessibility	<ul style="list-style-type: none"> <li>• School and district level performance data (percentage passing by grade) are downloadable from the Texas Education Agency's Web site.</li> <li>• Other score formats (Texas Learning Index, raw score, scale score) can be requested from the Texas Education Agency.</li> </ul>	<ul style="list-style-type: none"> <li>• Student-level data must be obtained by special request from the Texas Education Agency; agency data requests may have time and cost implications.</li> </ul>
Completeness	<ul style="list-style-type: none"> <li>• Student performance data can be requested on all test takers and also on subgroups (high poverty, high minority, special education, limited English proficient).</li> <li>• Test scores are available for a wide span of years (3–10 Texas Assessment of Academic Skills, 3–11 Texas Assessment of Knowledge and Skills).</li> </ul>	<ul style="list-style-type: none"> <li>• The universe of test takers has expanded with the introduction of the Spanish and 11th grade versions of the Texas Assessment of Academic Skills.</li> </ul>
Accuracy		<ul style="list-style-type: none"> <li>• Data available on the Texas Education Agency's Web site is limited to percentage passing, limiting the full range of variability in test results for research purposes.</li> </ul>
Consistency	<ul style="list-style-type: none"> <li>• Texas Assessment of Academic Skills testing provides a consistent span of test years and grades tested until 2002.</li> </ul>	<ul style="list-style-type: none"> <li>• The Texas Assessment of Knowledge and Skills replaced the Texas Assessment of Academic Skills in 2002–2003.</li> <li>• Texas Assessment of Academic Skills score reporting standards are not consistent.</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>• Texas Assessment of Academic Skills reports student performance results using the Texas Learning Index, which provided researchers with better aligned results for longitudinal analysis.</li> <li>• Demographic and programmatic information about test takers can be matched with test results.</li> </ul>	<ul style="list-style-type: none"> <li>• The state has not developed a way to align Texas Assessment of Academic Skills and Texas Assessment of Knowledge and Skills scores for longitudinal comparisons.</li> </ul>

*Student, School, and District Characteristics*

*Student Characteristics.* The Public Education Information Management System database collects a range of individual-level student characteristics. These data are reported on the Academic Excellence Indicator System Web site at the grade, school, and district levels. The Public Education Information Management System reports on each student’s poverty status, race/ethnicity, date of birth, sex, home language, grade, and school. Students are also identified as to their eligibility for special services (migrant, bilingual, limited English proficient, at-risk, Title 1 Part A) and their enrollment in special programs (special education, gifted and talented program, English as a second language, bilingual, career and technology education, etc.).

Table TX9

*Data Available in State Education Databases on Student Characteristics, Texas*

Student Characteristic	Data Source			
	Individual	Grade	School	District
Economically disadvantaged status	Public Education Information Management System	Academic Excellence Indicator System	Academic Excellence Indicator System	Academic Excellence Indicator System
Race/ethnicity	Public Education Information Management System	Academic Excellence Indicator System	Academic Excellence Indicator System	Academic Excellence Indicator System
Gender	Public Education Information Management System	Academic Excellence Indicator System	Academic Excellence Indicator System	Academic Excellence Indicator System
Special program participation (special education, gifted/talented, bilingual/ESL, LEP, migrant, at-risk, Title I, career and technology)	Public Education Information Management System	Academic Excellence Indicator System	Academic Excellence Indicator System	Academic Excellence Indicator System

*School Characteristics.* The Academic Excellence Indicator System database provides online descriptive information about each school, including grades served (e.g., early childhood, K–5, 6–8), type (elementary, middle/junior high, high school), enrollment by grade, accountability ranking, attendance and retention rates, and student mobility rate.

*District Characteristics.* In addition to the above-mentioned student and school characteristics that could be averaged across the district as a whole, the district characteristics that would be of relevance to resource allocation research includes a measure for district wealth. An important indicator of school district wealth in Texas is the taxable value of property. The Texas Comptroller of Public Accounts determines this measure on an annual basis. This information is available by request from the Comptroller’s office, and recent years’ values are compiled by the Texas Education Agency and posted on that agency’s Web site.

Table TX10

*Data Sources for School and District Characteristics, Texas*

Characteristics	Data Sources	
	School	District
School type (elementary, high school, etc.)	Academic Excellence Indicator System	N/A
Grade range	Academic Excellence Indicator System	Academic Excellence Indicator System
Total enrollment	Academic Excellence Indicator System	Academic Excellence Indicator System
Student poverty rate	Academic Excellence Indicator System	Academic Excellence Indicator System
Student race/ethnicity	Academic Excellence Indicator System	Academic Excellence Indicator System
Number of teachers	Academic Excellence Indicator System	Academic Excellence Indicator System
Per pupil expenditure	Academic Excellence Indicator System	Academic Excellence Indicator System
District wealth	N/A	Texas Education Agency’s Web site
Accountability ranking	Academic Excellence Indicator System	Academic Excellence Indicator System

*Community Characteristics.* Education databases do not contain information about characteristics of the community within which a school and/or district is located. Census information provides a number of relevant indicators for community well-being, including family income, parent education levels, and receipt of public assistance.

### *Summary of Findings*

*Alignment.* Data on instructional dollars; staff; teacher characteristics; student performance; and student, school, and district characteristics are available in Texas state databases. These data are housed in different data systems within the Texas Education Agency (Public Education Information Management System, Academic Excellence Indicator System, and student assessment databases) and different state agencies (State Board for Educator Certification, Texas Comptroller of Public Accounts). Aligning these data depends on the existence of common identifying variables that link one dataset to another. It also depends on the willingness of agencies such as the Texas Education Agency and State Board for Educator Certification to coordinate their responses to researchers' data requests. A joint, cross-agency project is under development that addresses the need for coordinated data reporting across multiple data sets. The Texas Public Education Information Resource (TPEIR) database is a cross-agency data management system that combines primary, secondary, and higher education information. The Texas Education Agency, the Texas Higher Education Coordinating Board, and the State Board for Educator Certification are compiling data collected and managed separately by these agencies into one central location. Users may access both raw data and aggregated reports from the Texas Public Education Information Resource (TPEIR) Web site (<http://texaseducationinfo.org/Index.asp>). Although the information available currently on the

Web site is fairly limited, a range of important data elements are proposed or will be posted in the near future.

Financial data are provided down to the school level through the Public Education Information Management System (PEIMS). School-level spending is organized by function, object, and program. As a result, researchers could identify school expenditures for instruction and instruction-related functions, with the information broken down by object categories. Researchers could also identify the amount a school spends for six specific instructional program areas (bilingual/ESL, career and technology, compensatory, gifted and talented, regular, and special education). This provides the researcher with the flexibility of aligning school spending to all other types of data since all that is needed is the common identifying variable of school identifier. Financial data are not, however, reported at the classroom or individual level in Texas.

Information on staffing patterns such as counts, full-time equivalency counts, and ratios is available from the Academic Excellence Indicator System (AEIS) Web site at the school level. Researchers are also able to obtain individual-level staff data that could be aggregated to a grade level (for teachers), school level (school staff) or district level (central office staff). Teacher characteristics are available on individual-level teachers and could be aggregated to grade, school, or district levels. These staff data could be aligned to fiscal data at the school level and to student data at the grade level. Although the Public Education Information Management System dataset contains both individual student and staff information, there is no way to link students to the teachers that teach their classes, hence the need to use the grade level or school indicator as the common identifying variable between students and teachers. The grade level a teacher is assigned to, however, cannot consistently be determined, and often a single teacher will have

assignments at multiple grades. This is especially true for teachers at the middle and high school level, where teachers are linked to subject areas more often than grade.

An important consideration regarding data alignment is the fact that teacher characteristics such as courses taught and full-time equivalency of position are collected by the Texas Education Agency, while the State Board for Educator Certification collects certification data. Both of these agencies use the teachers' Social Security number as a unique identifier; however, neither agency can release these numbers due to confidentiality policies. Additionally, certification data are collected using a cumulative process in which updates are made to teacher information without annual archives. Researchers must rely on the issue date and expiration date for each individual in order to create a subset of active, certified staff for a given study period. Data users must coordinate between the two agencies so that both use the same algorithm for scrambling Social Security numbers and pull the same teachers for the same study period. This requires significant coordination of effort, and the wait time for filling data requests at each agency can vary considerably.

*Accessibility.* A strong benefit to using existing Texas state databases is their accessibility. The following two elements increase the accessibility of data:

1. A significant amount of school- and district-level data are already compiled into reports or downloadable from the Texas Education Agency's Web site. Detailed documentation about data elements is also readily available from the Web site.

2. The Texas Education Agency has public information staff persons who are charged with helping outside users with special data requests. The agency has standardized procedures for receiving and managing outside requests for data, and their confidentiality policies are clear and consistent. One part of the data request process that limits accessibility to data is that these

services are provided for a fee, and the user must budget the cost of obtaining data into the total cost of conducting new research.

*Usability.* Overall, state education data in Texas provide a valuable and vast resource for education research. Databases contain a wide range of data elements available on finances, staff, students, schools, and districts.

These data are not without problems, however, and according to interviews with state data managers in Texas, the usability of the education data they compile is highly dependent on the ability of local school districts to collect and report accurate and reliable information. For example, the years of professional experience reported for teachers are often suspect. State data managers say that districts often misinterpret the instructions regarding this data element and report the number of years a teacher has been in their district rather than in the profession.

The relative complexity of these data also reduces their usability. Data users must rely on close examination of data documentation, periodic contact with state data contacts, and careful manipulation of the data for research use. Staff data recorded in the Public Education Information Management System can be particularly complex because a single staff person is likely to have multiple records linked by a unique identifier. Each record for a particular staff person will contain critical information about the individual's position(s), classes taught, salary, and other information. Merging multiple staff records into a single profile for a staff person requires in-depth understanding of the variable definitions and data structures.

Finally, of critical concern to researchers interested in examining the relationship between resources and student performance is the need for consistent measures for student performance. Texas has, for a number of years, expanded the number of students involved in testing while maintaining relative consistency in test standards through the Texas Assessment of

Academic Skills. With the elimination of this test and replacement with the Texas Assessment of Knowledge and Skills, researchers interested in longitudinal effects must either identify a method for aligning scores from these tests or use historical Texas Assessment of Academic Skills results.