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ABSTRACT

The newly revised Elementary and Secondary Education Act (ESEA 2001) has sweeping implications for how states collect, analyze, and use data about school and system performance. Policymakers must take a hard look at the design and capacity of their states' data systems, and determine what changes will have to be made to meet the requirements of the new law. This policy brief provides a short primer on data use, covering the topics of disaggregated data, ways of comparing school and student performance, and measurement of adequate yearly progress (AYP); information about longitudinal data systems and data structures needed for such systems that can measure student enrollment and progress over time; challenges of longitudinal systems, including cost and ensuring student privacy and confidentiality; a look at the resources available under ESEA 2001 for states to improve their information systems; and key issues for policymakers to consider in assessing the adequacy of their states' information systems. The policy brief concludes with a brief list of resources for further reading about state information systems. (RT)

# No Child Left Behind Policy Brief
# State Information Systems

By Ravay Snow-Renner and Marga Torrence



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NCLB Policy Brief

Education Commission of the States

# No Child Left Behind Policy Brief

## State Information Systems

***By Ravay Snow-Renner and Marga Torrence***

This is the second in a series of ECS reports examining the impact of No Child Left Behind (NCLB), the newly revised Elementary and Secondary Education Act on state policy and policymaking. Other reports will focus on accountability, school choice, leadership, literacy and teaching quality.



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The newly revised Elementary and Secondary Education Act (ESEA) has sweeping implications for how states collect, analyze and use data about school and system performance.

ESEA 2001 signals changing expectations about the quality and kind of evidence that will count in showing whether schools and states are doing their job of educating all students to proficient levels. The law's provisions – requiring annual student testing in grades 3-8 in mathematics and science, the reporting and use of disaggregated achievement data in calculating adequate yearly progress (AYP), and specific sanctions for schools and districts not making AYP – put pressure on states to have the most accurate information possible.

Collecting information about education programs and student achievement is not new for states. All but nine states, for instance, collect student-level information about achievement on state tests. Many can report broadly about how various groups of students are doing. But in general, state systems aren't yet able to put together different types of information – like enrollment and achievement – to look at the performance of individual students. This means that they can't identify students who have moved from district to district, or from school to school, and they can't look at individual student learning over time.

In the past 10 or 15 years, new and more sophisticated ways of measuring student and school outcomes have been developed, along with more advanced technology that allows data to be transferred and used more efficiently. But existing state data infrastructures haven't necessarily changed to be in step with the technology.

The new ESEA requirements – including a broader collection of information and a speedy turnaround of state assessment data to local districts – present an opportunity for states to improve the usability of their data systems. The law does not explicitly require states to have specific database structures, but it endorses databases that link students' test scores, the length of time they've been enrolled in given schools and graduation records over time.

In the coming months, policymakers must take a hard look at the design and capacity of their states' data systems, and determine what changes will have to be made to meet the requirements of ESEA 2001. This policy brief provides:

- A short primer on data use, covering the topics of disaggregated data, ways of comparing school and student performance, and measurement of adequate yearly progress
- Information about longitudinal data systems that can measure student enrollment and progress over time
- A look at the resources available under ESEA 2001 for states to improve their information systems
- Key issues for policymakers to consider in assessing the adequacy of their states' information systems.

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## State Information Systems (cont'd)

### A Short Primer on Data Use

#### Disaggregating Data

ESEA 2001 requires states to disaggregate data – separating, comparing and reporting information according to various student groups. Disaggregating data allows educators and policymakers to:

- Look at achievement patterns by different groups
- Identify the achievement gaps between different groups
- Identify and study schools that "beat the odds" in raising student achievement, compared to schools with similar students.

The emphasis on disaggregated data is in line with the new law's priority of improving achievement for all children. Achievement gaps occur between different groups of students in different states and regions, and it is only by first identifying these gaps that programs and policies can be designed to narrow these gaps.

Under ESEA 2001, states will have to disaggregate student achievement by the following categories:

- Major racial/ethnic subgroups
- Economically disadvantaged students (socioeconomic status)
- English language learners
- Students with disabilities
- Gender
- Migrant status.

Most states will have to update their data structures to meet all of these requirements. Florida is the only state that currently reports student achievement at the local level, disaggregated by all of these subgroups. Many states report enrollment data on certain subgroups of students, but few collect or report achievement by subgroup, especially at the school and individual student levels.

One of the more problematic aspects of the legislation is the socioeconomic status data. Typically, schools have collected these data on a schoolwide level, but have not reported them on a student basis in terms of performance.

States may collect and report more information than is required in the legislation, but these categories will be key starting points for state policymakers and database coordinators to examine in relation to ESEA requirements. Glynn Ligon, a database specialist with Education Software Publishing, a consulting firm, has written a summary of ESEA reporting requirements, available at http://www.educationadvisor.com/.

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## State Information Systems (cont'd)

### Comparing School or Student Performance

States can currently compare school or student performance in three different ways:

- **Comparing the same grade over time (cohort comparisons).** This method compares how students in selected grades perform in the current year with how students in that same grade performed in previous years. For instance, the reading performance of 4th-grade students in 2001 is compared with the reading performance of 4th-grade students in 2000, 1999 and 1998 to get an approximate trend analysis. (It is approximate because different students are in each of the 4th grades that are compared.)

- **Tracking grades over time (quasi-longitudinal comparisons).** This approach also uses cohorts of students, but the comparisons are of the same general cohort of students over time, rather than different groups of students. This approach requires regular testing. A quasi-longitudinal comparison might compare the reading scores of 4th-grade students in 1998 with the 5th-grade reading scores of students in 1999 and the 6th- and 7th-grade reading scores of students in 2000.

- **Tracking individual students over time (longitudinal comparisons).** A true longitudinal comparison tracks the progress of individual students – rather than groups of students – over time. This type of comparison also requires regular testing. A longitudinal comparison of students might compare each student's growth over a year with the state's average growth. These types of comparisons require databases that can track student enrollment and achievement over time.

### Measuring Adequate Yearly Progress (AYP)

ESEA sets expectations for states, schools and districts to help all students in the state reach proficiency in 12 years. To know where schools and districts are in relation to this goal, states are to define and calculate adequate yearly progress. Some alternatives for states are to:

- Choose performance standards and define AYP objectives in terms of increasing the percentage of students who score at the proficient level or higher on each assessment. For example, a state may need to bring 60% of its students up to proficient or advanced levels in 12 years. A state choosing this approach might define an AYP objective as having 5% more students (60% divided by 12 years) perform at proficient or advanced levels per year.

- Define several performance levels (such as novice, basic, proficient and advanced) and set AYP targets based on a combination of changes in the proportion of students at each level. In this model, schools might receive partial credit for moving students from the novice to the basic level, full credit for moving students from novice or basic to proficient levels and a small bonus credit for increasing the percentage of students in the advanced category.

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## State Information Systems (cont'd)

For more information on issues covered in this policy brief, please visit the ECS Accountability Issue Site at http://www.ecs.org/ecsmain.asp?page=/html/issues.asp. Select Accountability (K-12) and then select Data Storage and Use.

- Assign scores to performance categories and judge improvement in terms of increased average scores. In this model, student improvement across all performance categories will lead to higher average scores in the system.

### Longitudinal Data Systems

Longitudinal student-unit databases provide the best, most accurate information for both policy decisions and decisions at the district and school levels. They can provide information about student growth over time that can then be linked with the teachers, programs and schools that have served those students. They also can provide fairer comparisons of schools than data systems that rely on cohort comparisons, because they ensure school performance is based only on students who have been continuously enrolled in that school. Finally, because they can match student records over time, they offer a way to follow student progress statewide and to verify the accuracy of district information – particularly about student transfers and dropouts.

Longitudinal data that can be disaggregated by different groups provides useful, accurate information about school and student progress. It allows educators and policymakers to:

- Look at student growth by school for different types of students. For example, are some middle schools preparing Hispanic students for high school better than others? Are they providing those students with a greater "value-added" experience?
- Identify which programs work best for which students at which ages
- Identify the relationship between early achievement levels and later student success
- Look more accurately at patterns of mobility and dropout rates across student groups.

Longitudinal comparisons also have advantages over cohort comparisons – which use "snapshot" data. School ratings based on snapshot data can change radically from year to year – especially for schools in neighborhoods that are changing fast. In situations where successive 4th-grade classes look very different from year to year, these snapshots do not provide clear pictures of school performance. They don't show where students came from, how long they've been in the school or how well they have done in previous years.

Longitudinal data can also take student mobility into account. It is not fair to hold schools accountable for the test scores of students who only enrolled there the week before the test, because those schools have had little opportunity to make a difference with those students. It is not a fair measure of school productivity when test scores rise and fall from year to year based on differences in groups of children. Only comparisons that track student learning over time – and can take into account student mobility – can offer solutions to these problems.

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## State Information Systems (cont'd)

### Two Examples of Longitudinal Data Systems

Tennessee's Value-Added Assessment System (TVAAS) is an example of a longitudinal accountability model. Beginning in 1997-98, Tennessee started testing every student in grades 2 through 8. TVAAS examines year-to-year gains of each student and compares them with gains made by a normative sample for the same subject in the same grades. The data are used to look at the "value added" by a teacher or by a school, compared with the value of other teachers and schools. A legislative review of the TVAAS is available at: http://www.comptroller.state.tn.us/orea/reports/tvaas.pdf.

A second example is the reporting model developed by Just For the Kids (JFTK) of Austin, Texas. The JFTK model reports school results in reading and mathematics. It calculates school performance based only on the students who have been in that particular school for two years or more – which is made possible by a data structure that can track student enrollment and achievement over time. JFTK is working with several states to develop these data infrastructures. More information is available at http://www.just4kids.org/.

### Data Structures Needed for Longitudinal Data

Longitudinal comparisons emphasize the goal of improved learning for all students. Making such comparisons requires a comprehensive database that is capable of tracking student enrollment and achievement information over time and across school and district lines. The database has to be able to look at individual student information, not just information about groups of students.

There are three key characteristics of a longitudinal student-level database that are needed for optimal accuracy:

- Two collections of student-level data are conducted per year: (1) in the fall, student-level enrollment, socioeconomic and program participation data, disaggregated as required for ESEA (this is not a student head count by school, but rather a separate database with one record for each student) and (2) in the spring, test data for all students in tested grades. Why? This helps to satisfy ESEA requirements for accurate dropout rates and identifies students who have been enrolled in English as a Second Language (ESL) or bilingual programs for three years. It also ensures the accuracy of demographic and program participation information, provides a check of whether some districts are having students "disappear" from spring testing data and makes it possible to report separately on the proficiency of students who have been continuously enrolled for three years or longer.

- A statewide student-identifier system is in place to help match student records over time and as students change schools and districts. Why? This helps to satisfy ESEA requirements for accurate dropout rates and correct identification of students who have been enrolled in ESL or bilingual programs for three years. It also can be used to create "value-added" measures of student growth and evaluate the long-term effects of programs and policies.

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## State Information Systems (cont'd)



The Education Commission of the States is a nonprofit, nationwide organization that helps state leaders shape education policy. It is ECS policy to take affirmative action to prevent discrimination in its policies, programs and employment practices.

Copies of this report are available for $4.00 plus postage and handling (see these costs in far right-hand column) from the Education Commission of the States Distribution Center, 700 Broadway, Suite 1200, Denver, CO 80203-3460; 303.299.3692. Ask for No. GP-02-03. ECS accepts prepaid orders, MasterCard, American Express and Visa. All sales are final.



- The spring test database includes records on all students in tested grades. Why? This enables policymakers to keep track of student exemptions or absences from testing and prevents districts from "hiding" students they would rather not test. (Source: JFTK Staff, March 2002)

These are the minimum components of a longitudinal system. For a more useful and comprehensive system, states might also consider:

- Collecting information about high school course completion and participation and success on SAT, ACT and Advanced Placement exams
- Matching student records between K-12 and higher education, to track student success at the postsecondary level
- Collecting information about student performance on other assessments, in addition to statewide tests in the spring.

### Challenges of Longitudinal Systems

States will face several challenges in transforming existing data systems into longitudinal systems, including:

- **Cost.** The cost of expanding current data infrastructures will depend on the nature of each state's data system and also whether states act alone, or whether they are able to collaborate with other states.
- **Assuring student privacy and confidentiality.** All states are already subject to privacy rules under the Family Educational Rights and Privacy Act (FERPA), which protects the privacy of student education records (Source, 20 U.S.C. § 1232G;34 CFR part 99). Creating common links across databases does not in and of itself add any more rules or requirements. State laws may, however, require additional privacy measures.

States are in varying states of readiness to implement longitudinal student databases. The following table shows the status of state progress in developing these systems, as of spring 2002.

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## State Information Systems (cont'd)

| States with student longitudinal database systems (17) | States developing student longitudinal database systems (10) | States without student longitudinal database systems (23) |
|---|---|---|
| Arkansas | Alaska (2003) | Alabama |
| Connecticut | Arizona (2003) | California |
| Delaware | Ohio (2003) | Idaho |
| Florida | Washington (2003) | Illinois |
| Louisiana | Nevada (2004) | Indiana |
| Maryland | New York (2004) | Iowa |
| Massachusetts | Rhode Island (2004) | Kansas |
| Minnesota | Colorado (No date set) | Kentucky |
| Tennessee | New Jersey (No date set) | Maine |
| Texas | New Mexico (No date set) | Missouri |
| Georgia (2002) | | Montana |
| Hawaii (2002) | | Nebraska |
| Michigan (2002) | | New Hampshire |
| Mississippi (2002) | | North Carolina |
| Oregon (2002) | | North Dakota |
| South Dakota (2002) | | Oklahoma |
| Vermont (2002) | | Pennsylvania |
| | | South Carolina |
| | | Utah |
| | | Virginia |
| | | West Virginia |
| | | Wisconsin |
| | | Wyoming |

*Note: States in the third column either have no plans to match student records statewide by identifier, no student-level enrollment data collected on a statewide basis, and/or no statewide student-achievement testing.*

### ESEA Resources for Information Systems

ESEA provides some resources to help states reconfigure their information systems. These include:

- Under Title VI, Part A, Section 6111, the U.S. Department of Education may provide funding to help states that have already developed the required assessments in grades 3-8 for the purpose of improving the dissemination of performance information or to assist in linking student achievement, enrollment and graduation records over time.
- Title I, Part E, Section 1501(b) allows for federal guidance and technical assistance to states in developing and maintaining management information systems.
- Title V, Section 5121, subsection (6) allows states to use funds made available under that section for "support for arrangements that provide for independent analysis to measure and report on school district achievement."

### Key Considerations for States

In assessing the adequacy of their current information systems within the context of ESEA 2001, state policymakers should consider these key factors:

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## State Information Systems (cont'd)

This *Brief* was written by **Ravay Snow-Renner** and **Marga Torrence,** who are policy analysts at the Education Commission of the States.

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- **The relative costs and benefits of revising the present structure to a student-level, longitudinal structure.** Costs may be fiscal – in terms of expanding current data structures and developing unique student identifiers – or they may be political – involving privacy issues and the relative trustworthiness of snapshot vs. longitudinal data. Costs will vary from state to state, and should be weighed against the benefits of better, more useful information.

- **Whether to adopt a more centralized or decentralized data model.** The most cost-effective response to ESEA is to adopt a centralized data model, in which the state serves as the central repository of district and school information. For some large states that already have a comprehensive centralized structure, like Florida and Texas, this is a viable strategy. An alternative option for states is to develop a technology-supported system where the state collects some information and districts keep other information. Data may flow up and down the system based on reporting needs. A decentralized approach helps to preserve local autonomy and data ownership. In this option, a challenge is to ensure data quality and standardize collection and reporting formats statewide.

- **Whether cross-state collaborative database efforts are viable.** Oregon, Idaho and Washington database administrators, for example, are working collaboratively to develop a unique student-identifier system across all three states. Oregon has developed a method for assigning unique identifiers (piloted in fall 2001) that Washington and Idaho are also beginning to use. When this system is fully operational, it will be possible not only to track student transfers across districts, but also across states.

- **Ways in which education data can be made more actionable** – not only at the state level, but also for local educators. A longitudinal database offers more reliable information than snapshot models, but more needs to be done to help administrators, parents and teachers use state accountability results to improve student achievement. Combinations of frequently collected local data, supplemented by annual state accountability results, show promise. Reporting results is not enough. Educators and parents need models and assistance in learning how to use performance data to improve practice.

### Resources

A new ECS publication, *No State Left Behind: The Challenges and Opportunities of ESEA 2001,* summarizes the ESEA 2001 law, looks at where the states stand in regard to requirements of the new law and suggests policy questions to consider when deciding how to respond to ESEA. (GP-02-01, 70 pages, $12.50 plus postage and handling)

Additional information about the benefits of a state longitudinal student-level data system is available in a 2001 *Education Week* article by Chrys Dougherty of JFTK. See http://www.educationweek.org/ew/ewstory.cfm?slug=33dougherty.h20&keywords=Chrys%20Dougherty.

National Center for Education Statistics (2000). *Building an Automated Student Record System: A Step-by-Step Guide for Local and State Education Agencies.* Retrieved March 20, 2002, from the World Wide Web: http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2000324.

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