

Archived Information

Improving Our Data and Information Systems

The Department of Education (ED) faces multiple challenges in acquiring high-quality outcome data. Federal money constitutes less than 10 percent of the investment in education nationally, and ED's dollars are often combined with local, state, and other Federal monies, making it difficult to isolate the impact of congressionally appropriated program funds. This mix of funds at the local level also poses challenges for the program managers and practitioners who are asked to complete multiple Federal, state, and local performance reports, each of which require slightly different data. In addition, local implementation of the same Federal program often differs dramatically, which adds challenges to collecting a common core of outcome data.

To address those challenges and to meet the goals of ED's Strategic Plan, three major strategies have been developed, of which two are long-term and one is short-term:

Long-term:

- Create a new integrated data system for elementary and secondary education data that coordinates data systems with states.
- Improve old data systems, particularly for postsecondary financial aid data.

Short-term:

- Develop a system that continuously fosters attention to and improvement in our programs' data quality--the Data Quality (DQ) Initiative.

In the long term, two strategies have been developed, one for elementary and secondary education and one for postsecondary education. For elementary and secondary education, plans were developed for an integrated program data system and a two-state test of concept was completed. The Integrated Performance and Benchmarking System streamlines and integrates existing data systems to improve their timeliness and utility. For postsecondary education, the focus is on improving old systems through extensive reviews and audits.

In the short term, all ED programs will participate in its DQ Initiative, a system designed to promote discussion of, attention to, and improvement in the overall quality of ED program performance data. Each of these strategies are discussed in the following pages.

Long-term Strategy #1: Creating a New Data System for Elementary and Secondary Education Programs

An important component to the information improvement strategy is a long-term plan to create an Integrated Performance and Benchmarking System (IPBS) for elementary and secondary program data collection. The IPBS is a vision of an Internet-based system for harvesting information from states regarding Federal program activities at the school and district levels. The system would allow users to link Federal program participation and outcome information to characteristics of recipient states, districts, and schools. The IPBS could help to meet policy makers' need for timely, outcome-based information while streamlining, modernizing, and reducing the reporting burden on states from Federal information requests.

The IPBS relies on a new approach to Federal-state exchange of information about Federal program outcomes. States will no longer send data to the Federal government. Rather, states will

collect and store the data in their own warehouses in such a way that the Federal government can harvest them. States will monitor and ensure the quality of district- and school-collected data.

Specifically, the IPBS is

- **A shared set of core data and performance indicators.** ED and states will work together to identify key policy questions about program outcomes and characteristics of program recipients. Examples of key performance indicators appear in Exhibit 4.
- **An electronic data harvesting system designed to minimize the burden on states.** The IPBS will harvest data from state administrative records and will be designed to be compatible with modern state data systems.
- **A program database resource shared by ED and states.** Reports could include a national education report card displaying progress on key Department Strategic Plan performance objectives and annual performance reports.

Exhibit 4.

Examples of Key Performance Indicators (IPBS Test of Concept 1999-2000)

1. **High school attendance and graduation rates:** We will measure progress toward our goal of continually improving attendance and graduation rates, particularly in high-poverty schools and among students with disabilities and others at risk of failure.
2. **Aligned Assessments:** We will measure progress toward our goal that, by 2001, all states will have assessments aligned to challenging content and performance standards for two or more core subjects.
3. **School Choice:** We will measure progress toward our goal that, by 2003, 25 percent of all public school students in grades 3-12 will attend a school that they or their parents have chosen.
4. **Computers:** We will measure progress toward our goal that, by 2001, the ratio of students per modern multimedia computer will improve to 5:1.
5. **Achievement Tests:** We will measure progress toward our goal of having increasing percentages of all students meet or exceed basic, proficient, and advanced performance levels in National and state assessments of reading, math, and other core subjects.

ED sponsored a two-state test of the concept to explore the feasibility of the IPBS. This test was undertaken in partnership with the Council of Chief State School Officers and the states of Nebraska and Oregon, and the objectives were as follows:

- To assess the feasibility of the IPBS on a small scale by harvesting current-year program performance data from two state data warehouses via the Internet and using the data to create a Web site and database.
- To assess the types of technical assistance states may require to modify their data warehouses and collection methods to be able to participate in data harvesting.
- To use the experiences gained from the two-state trial to better estimate the required costs, time, and challenges involved in developing a full-scale IPBS.

To assess feasibility, we started with two states with substantially different data systems. The test of the concept version of the IPBS includes data on all districts and schools in Nebraska, with the exception of achievement data, which are available only for Title I schools. The test also includes data from the 15 districts and 325 schools that are participating in Oregon's Data Base Initiative.

We focused on a few data elements from several elementary and secondary Federal education programs, in particular the following:

- | | |
|---|--------------------------------|
| ❖ Title I | ❖ McKinney Homeless Assistance |
| ❖ Technology Literacy Challenge Fund | ❖ Perkins |
| ❖ Safe and Drug Free Schools | ❖ Title VI |
| ❖ IDEA Part B | ❖ Impact Aid |
| ❖ Eisenhower Professional Development Program | ❖ Goals 2000 |

The Department is now studying whether or not to expand the test of the concept to a pilot phase with additional states and programs.

Long-term Strategy #2: Improving Postsecondary Data Systems

Validity and accuracy of postsecondary performance measures. Data used to measure progress toward achievement of the performance indicators come from several sources, including program data, surveys conducted by the National Center for Education Statistics (NCES), and evaluation studies. Steps taken in 1999 and 2000 to strengthen the quality of these data include the following:

- Improving the coordination of data related to postsecondary education through the National Postsecondary Education Cooperative (NPEC), which is sponsored by NCES with the mission "to promote the quality, comparability, and utility of postsecondary data and information that support policy development, implementation, and evaluation." NPEC will help improve the efficiency and usefulness of the data reported on postsecondary education by standardizing definitions of key variables, avoiding duplicate data requests, and increasing the level of communication among the major providers and users of postsecondary data.
- Continuing to support and strengthen NCES's major postsecondary data collection activities, including the Integrated Postsecondary Education Data System (IPEDS), the National Postsecondary Student Aid Study (NPSAS), the Beginning Postsecondary Student Study (BPS), the Bachelor's and Beyond Study (B&B), and the National Education Longitudinal Study (NELS). A major area of expected improvement in the quality of these data collections is the use of the Internet to obtain data from institutions. The use of the Internet will also reduce the burden on institutions of providing data to ED.
- Using the \$3 million provided in fiscal year 2000 for the GPRA Data/HEA Program Evaluation Program to improve the amount, quality, and timeliness of information on the performance of postsecondary education programs. The funds will be used to begin evaluations of the Title II programs, support major NCES data collections, and obtain

more accurate and timely data on the performance of student aid and higher education programs.

Accuracy and efficiency of program data systems. In fiscal year 2000, the Department of Education will provide over \$51 billion in Federal student aid funds. To properly distribute and account for these funds, the Department of Education needs to process and store data from over 8.5 million student aid applications, 93 million individual student loans with a value of more than \$150 billion, 6,000 postsecondary institutions, 4,100 lenders, and 36 state guarantee agencies. Ensuring the accurate and efficient collection of these data is a key component in the successful delivery of the student aid programs and achievement of Goal 3 in ED's Strategic Plan, which is to "Ensure access to postsecondary education and lifelong learning."

The Higher Education Amendments of 1998 established a performance-based organization (PBO) to modernize the delivery of student financial aid. This is an historic milestone in the Administration's efforts to improve services to millions of students and the postsecondary institutions they attend. The PBO will make it possible to meet these challenges and keep pace with the rapid rate of technological change in the financial services industry. Customer service will improve, and the public's confidence in the administration of student aid programs may grow as a result. Steps being taken by the PBO to improve data accuracy, which improves the efficiency and quality of the student aid delivery system, include the following:

- Continuing or expanding interagency coordination on data matches—with the Internal Revenue Service; the Social Security Administration; the Immigration and Naturalization Service; the Selective Service; the U.S. Postal Service; and the Departments of Defense, Justice, and Housing and Urban Development—to help reduce the burden on respondents.
- Establishing industry-wide standards for data exchanges to stabilize data requirements, improve data integrity, and reduce costly errors.
- Receiving individual student loan data directly from lenders rather than through guarantee agencies and expanding efforts to verify the data reported to the National Student Loan Data System.
- Working with the IRS to establish procedures for verifying income tax data provided by students and their families in applying for Federal student financial assistance.
- Strengthening indicators of customer satisfaction to provide early warnings of possible delivery system problems. This step will build on ED's successful, ongoing evaluations of its institutional and student aid customers.
- Refining a risk management system that encompasses all relevant data regarding postsecondary institutions' operation and management of student aid programs, so that compliance and enforcement activities can be targeted to poorly performing institutions.
- Preparing a system architecture for the delivery of Federal student aid that will help integrate the multiple student aid databases based on student-level data, to improve the availability and quality of information on student aid applicants and recipients.

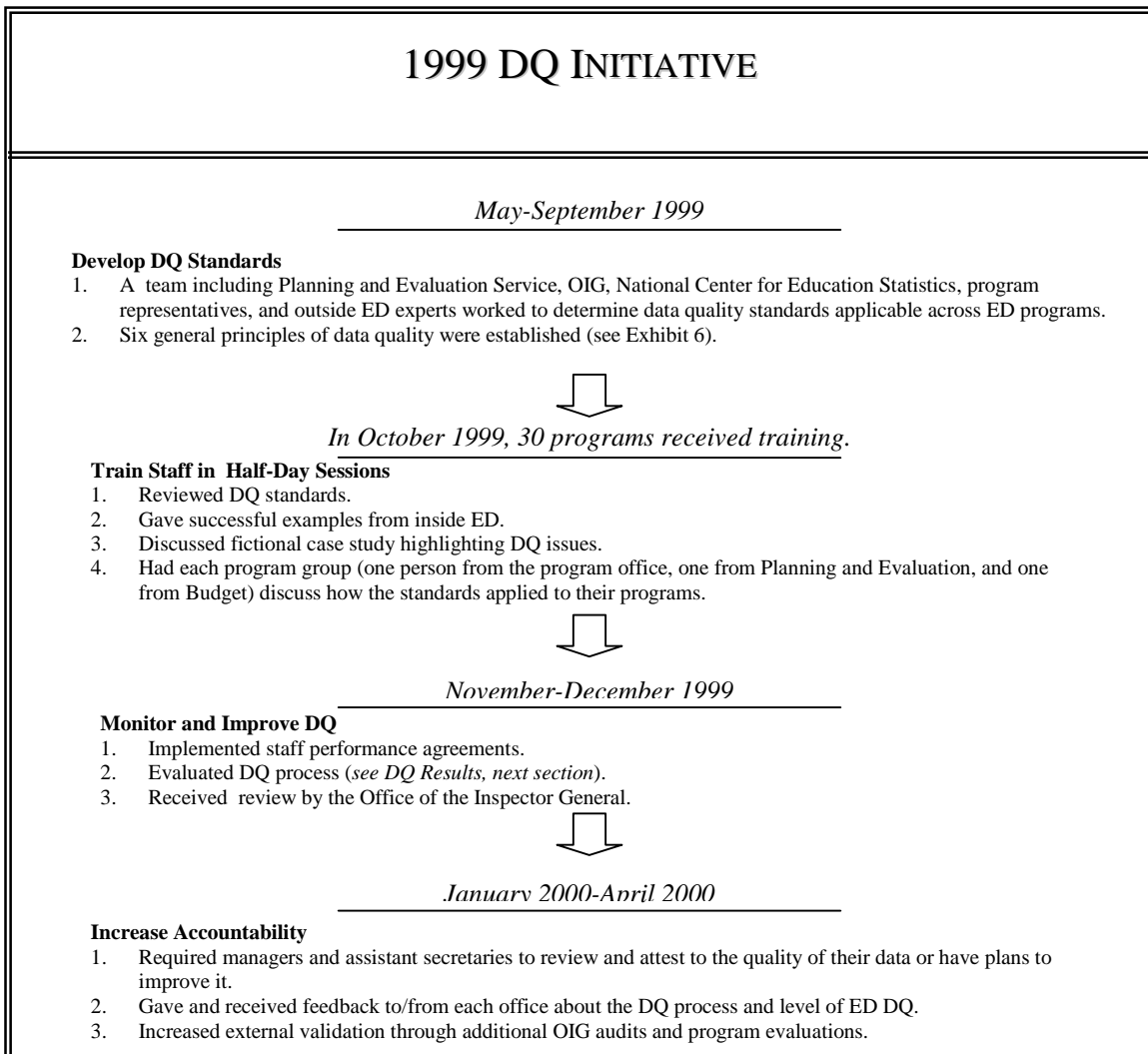
Short-term Strategy: The DQ Initiative

DQ Initiative Process

During 1999, the first phase of the DQ Initiative was implemented. Exhibit 5 summarizes the four main components of the initial phase.

- Develop DQ Standards
- Train Staff
- Monitor and Improve DQ
- Increase Accountability

Exhibit 5



The DQ Standards are six standards for judging program DQ (see Exhibit 6). These standards were developed by statisticians and other experts in data collection; they were written in nontechnical terms so nonexperts could understand them. Although simple in principle and easy to remember, the standards have broad applications and implications for current ED data systems. After training in these standards, ED staff reviewed their program data and, as a part of the new

data accountability, reported this information to their assistant secretaries, who then signed a formal attestation that their data are sound or that they have plans to improve the data. These attestation forms were then sent to the Office of the Under Secretary.

While next year all ED programs will participate in the initiative, this year it was mandatory for the 17 largest of our programs, which constitute 90 percent of the budget. An almost equal number of programs volunteered to participate, for a total of about 30 programs.

Develop DQ Standards. The Department now has a working draft of DQ standards entitled “Standards for Evaluating the Quality of Program Performance Data” (see “Data Quality Standards” appendix and Exhibit 3). Since 1998, the Planning and Evaluation Service (PES) office of ED has been developing these standards in close consultation with the OIG, the National Center for Education Statistics, and several program offices.

Exhibit 6

DQ Standards and Sample Checklist Questions (1999 Working Draft)

1. *Validity:* Data adequately represent performance.
Have the objective, performance indicator, and data been scrutinized to be sure that they all describe the phenomena of interest?
2. *Accurate Description:* Definitions and counts are correct.
Have clear, written definitions of key terms (including inclusions/exclusions) been communicated to data providers?
3. *Editing:* Data are clean.
Have you discussed large changes or unusual findings with the primary data providers to see if they might be due to editing errors?
4. *Calculation:* The math is right.
Have the + or – confidence intervals been reported for sample data?
5. *Timeliness:* Data are recent.
Is a regular schedule of data collections in place to meet policy information needs?
6. *Reporting:* Full disclosure is made.
Are data quality problems at each level reported to the next level?

(Complete DQ Standards are found in the Appendix)

Train Staff. In 1998, the Inspector General found that a lack of staff qualified in “information processing, evaluation, and reporting” and the “difficulty of analyzing and interpreting performance measurement data” were two of the three most frequently identified barriers to successful GPRA implementation. We reacted to this finding by developing and providing DQ training. This past year, nearly 30 programs and 100 ED staff participated in the training. Each of the participating programs was trained to assess the quality of its data using checklists based on the standards. Program managers then submitted their completed checklists and forms through their division directors to their assistant secretaries, who discussed DQ problems and resource needs. Assistant secretaries then attested to the quality of their data or submitted plans for improvements.

The attestation forms were designed in the spirit of full disclosure; the Department emphasized that it was essential to reveal the current quality of the data for us to advance the quality of our data overall. To encourage full disclosure and continuous improvement, programs were told that

what mattered most were their plans to improve the data and subsequent implementation of those plans. Programs would not be held accountable for the current level of DQ but would be held accountable for developing—and following through on—plans for improvement.

Monitor and Improve DQ. The Planning and Evaluation Service reviewed the attestation forms that were submitted by program offices and discussed with each office the accuracy and validity of its data and its plans to improve that data. As a part of this review process, PES also looked for opportunities for intra- and interagency collaboration in data collection efforts.

Staff from the Office of the Inspector General (OIG) attended DQ training and reviewed the implementation of the DQ Initiative.

Increase Accountability. In ED's fiscal year 2000 performance plan, the Department demonstrated its commitment to achieving high-quality data by adding this indicator: "By 2000, all ED program managers will assert that the data used for their program's performance measurement are reliable, valid, and timely, or will have plans for improvement." In 1999, ED was well under way to meeting this goal. Through the DQ attestation process, assistant secretaries gained (1) a greater awareness of their data, particularly its weaknesses; (2) resource and staffing needs required for high-quality information; and (3) systems information they need to think strategically about the initiation of new systems to improve ED data over the long term and intra- and interagency coordination.

The preliminary results of the DQ Initiative are presented in the following section.

DQ Pilot Project Findings

At the foundation of the DQ Initiative were two basic goals: (1) to begin discussions about DQ by focusing the attention of data managers and assistant secretaries on the issues of DQ, and (2) through those discussions, to begin to improve the overall DQ within ED. Given these goals, the first phase of implementation seems to have been successful.

Three people associated with data collection in each program assessed the DQ for each indicator in the congressional budget justification for their program. Each program submitted approximately three forms (programs had on average three budget indicators each).

The results appear in Exhibit 7. Most indicators met the standard, many with limitations. Only about 4 percent of indicators failed entirely to meet the standards.

- Standard 1, *Validity*. Nearly half of the indicators met the standard without any limitations identified (45). Over 80 percent (84) met the standard without any limitations or with some with limitations identified.
- Standards 2-5, *Accuracy, Editing, Calculation, and Timeliness*. This proved to be the most difficult to meet without limitation. Only about 30 percent of indicators met the standards. About 87 percent of indicators met the standards or met them with some limitations identified.
- Standard 6, *Reporting*. Approximately 61 percent of the indicators met the standard, and another 19 percent met the standard with some limitations.

Exhibit 7

Summary of Assessment of ED Data Quality (DQ)			
	Std 1	Std 2-5	Std 6
	<i>Validity</i>	<i>Accuracy, Editing, Calculation, Timeliness</i>	<i>Reporting</i>
Met Standard	45	30	61
Met Standard w/ Some Limitations	39	57	19
Did Not Meet Standard	3	2	5
Other (e.g., “N/A,” waiting for data)	16	14	18
Total number of indicators for which attestation forms were submitted	103	103	103

Exhibit 8 shows that three-quarters (74 percent) of the submitted attestation forms included plans for improving the quality of program data. Of those, over 70 percent cited relatively significant plans for improvement. For example, the Office for Civil Rights reported that it intended to replace its current Case Information System (CIS) with an entirely new data collection system, and they are exploring interim solutions (e.g., “adding a field in CIS for annotations”) until the new system is in place. The Office of Bilingual Education reported that it was going to disseminate evaluation guidance with uniform instructions, move to an annual evaluation report to increase the frequency of data, and expand monitoring specifically to include discussions about data quality (DQ). Some offices focused on specific aspects of DQ. For example, the Regional Laboratories reported that it is going to develop a cross-Laboratory policy regarding follow-up with non-respondents to surveys.

For data verification and validation, about 60 percent of the attestation forms cited plans for improvement. Offices reported beginning to institutionalize various forms of validation and verification, including cross-checks (e.g., Eisenhower program), peer review (e.g., Compensatory Education Program), periodic data review (e.g., Impact Aid), follow-up on missing data (e.g., Foreign Language Assistance), and using data from other ED offices (e.g., Technology Literacy Challenge).

Exhibit 8

Summary of Data Quality and Verification/Validation Plans		
	In-depth Plans for Improving Data Quality	Plans for Further Verification & Validation Efforts
Cited Plans for Improvement	54	40
Minimal Plans	21	20
No Current Plans	20	31
Other (e.g., “N/A,” waiting for data)	8	12
Total Number of Attestation Forms Submitted (One Form per Indicator)	103	103

An additional goal of the first phase of implementation was to test and improve the implementation of the Data Quality Initiative (DQI). We learned through this pilot project that the process works very well for program-specific indicators, but it does not work well with cross-

cutting indicators. An indicator such as “all schools will use technology” or “all children will learn to read” cut across many of our programs. However, the attestation process is organized by program, not indicator. Since we are striving to have many cross-cutting indicators to reflect our core processes, we are looking for ways to amend the current attestation process to facilitate and even encourage indicator-driven collaboration and DQ reviews. In addition to these observations, we are collecting information about how to continue to improve the DQI through the following:

- Training evaluation forms
- Focus groups with project teams (one person from each office: Program, Budget, and PES) and individual offices (e.g., only PES staff)
- Individual interviews with program managers, assistant secretaries, budget analysts, and PES staff

From the evaluation forms, it seems that the 1999 first phase DQ training sessions were generally well received. The participants rated both the training sessions and the materials 7 out of 10 possible points, where 10 is high. On their evaluation forms, the training participants also gave some important feedback that ED is using to revise the training sessions for next year.

It is our goal to expand and improve the training sessions and DQI issues in the Department over the coming years, so the quality and timely use of our performance data will continually improve.