

INSTITUTE OF EDUCATION SCIENCES

First Biennial Report to Congress

2002-2004

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This report was prepared by the Institute of Education Sciences, U.S. Department of Education. It is required by the Education Sciences Reform Act of 2002 and covers activities of the Institute from 2002, the year of its establishment, through 2004.

Biennial Report to Congress
Institute of Education Sciences

The Education Sciences Reform Act of 2002 (ESRA) established a new organization within the U.S. Department of Education, the Institute of Education Sciences (the Institute). The mission of the Institute is to expand knowledge and provide information on: the condition of education (through the National Center for Education Statistics); practices that improve education outcomes (through the National Center for Education Research); the effectiveness of federal and other education programs (through the National Center for Education Evaluation and Regional Assistance); and the educational needs of children with disabilities (through the National Center for Special Education Research as authorized in December of 2004 in the Individuals with Disabilities Education Improvement Act).

The Institute is led by a Director at the deputy secretary level who is nominated by the President, confirmed by the Senate, and serves a term of 6 years. Dr. Grover J. (Russ) Whitehurst, a research psychologist, became the first director on November 22, 2002.

This bill creates an Institute of Education Sciences ... Of all of the potential federal functions, the research role remains the most unrealized in the course of the past half century, despite being one of the few roles that almost everyone agrees is uniquely appropriate for the federal government.

Christopher T. Cross,
Center for Education Policy

The Institute is overseen by the National Board for Education Sciences—15 highly qualified individuals, the majority with strong research backgrounds, who are nominated by the President and confirmed by the Senate. The Board was confirmed by the Senate at the close of the 108th Congress, and held its first meeting in February of 2005. The Institute has a full-time staff complement of about 200 and is responsible for roughly \$600 million annually in external grants and contracts through six budget line items (research and dissemination, statistics, assessment, special education research, regional laboratories, and statewide data systems) and through evaluation set-asides in the budgets of other Department of Education programs.

The Institute was born out of a shared sense among policymakers, the legislative branch, and the executive branch that education practice and research were badly in need of reform. Capturing this view, the National Research Council concluded that, “the complex world of education—unlike defense, health care, or industrial production—does not rest on a strong research base. In no other field are personal experience and ideology so frequently relied on to make policy choices, and in no other field is the research base so inadequate and little used” (Improving Student Learning: A Strategic Plan for Education Research and Its Utilization, 1999).

This, the first biennial report to Congress by the Director, as required under ESRA, describes three goals that have guided the work of the Institute and provides an overview of progress through the end of 2004. It describes the major projects carried out within each center of the Institute over the past two years. And, as required by ESRA, it includes a list of all grants and contracts in excess of \$100,000 made during the first two years of the Institute’s existence.

MAJOR GOALS

Rigor of research

Far too much education research is based on methodologies that cannot support the questions that are addressed or the conclusions that are drawn. For example, qualitative and interpretative methods have been frequently deployed to address causal questions. These methods have their place in describing program implementation and generating hypotheses in areas in which research is just beginning, but they do not answer the practical issues of which programs and approaches work best for which students under what circumstances. In the quantitative realm, correlational analyses are frequently used to advocate for or against education policies even though every undergraduate is taught that correlation is not causation. Statistically sophisticated models of correlations among classes of related variables can advance our understanding of possible relations between education processes and outcomes, but far too much policy advocacy in education draws causal conclusions from simple associations, e.g., “participation in the arts enhances academic achievement,” “use of the internet at home improves science scores,” and so on.

For a range of critical policy questions, the nation needs rigorous analyses of cause and effect using the same randomized trials and related methods that are deployed in health care and other fields where questions of what works are of prime importance.

The Institute has moved aggressively to advance the rigor of education research. Starting with funding announcements, proceeding to peer review, and carrying through to funding decisions, the Institute processes are designed to assure that successful grantees or contractors employ rigorous methodologies.

“For a quarter of a century, American education researchers have tended to favour qualitative and descriptive analyses over quantitative studies.... This has now changed.”

Joshua D. Angrist,
MIT

Relevance of research

The second goal that has guided the work of the Institute is to increase the relevance of education research. In preparation for the work of the Institute, we conducted a purposive survey of education practitioners and policymakers on the usefulness of research. A typical response was, “There may be less than one percent of the existing research that’s really meaningful to teachers.... Teachers need strategies, practices. Give them things that can help teaching and learning, things that can help kids.” While one may quibble about the percentage of research that is relevant, virtually everyone agrees that we need much more education research that addresses practical problems in powerful ways.

We are assuring the relevance of our research investments by tuning our priorities to the needs of education practitioners and policymakers. For example, as states have moved to expand their pre-K education offerings, questions of which preschool curricula work best for whom under what circumstances have become critically important. Responding to this need, the Institute

funded the Preschool Curriculum Evaluation Research (PCER) Project, which involves an evaluation of 14 curricula involving over 3,800 children in 13 states. It included an evaluation of one of the most widely used curricula among Head Start programs.

Later this year we will issue the first report from this project that will identify those curricula that are effective in enhancing school readiness.

“American education research has turned a corner.”

Frederick Hess,
American Enterprise Institute

Utilization

The third goal that has guided the Institute is to translate the results of education research into practice. Producing new education research that is both rigorous and relevant will help. However, the history of other fields suggests that more is involved in the use of good research than its mere presence. Evidence-based decisionmaking in other fields is enhanced by decision support tools that make the results of research available to users in easily understood forms. Education will adopt research-based approaches much more rapidly if there are differential consequences for decisionmakers whose choices are or are not grounded in evidence, and if it is easy to access and use such evidence.

The What Works Clearinghouse (WWC) is critical to our effort to promote the use of research in education decisions. It is fundamentally different from prior national efforts to synthesize evidence on education programs in that it relies on a set of specific and clearly described protocols for judging the scientific quality of studies. For the first time, an administrator faced with the choice of mathematics curricula for middle school or tutoring methods for struggling readers, etc., will be able to determine which programs have rigorous evidence of effectiveness associated with them. As the results from the WWC come to play a role in state and federal decisions on discretionary grants and the flow of program funds to schools, we expect that practitioners will want to consider evidence on what works, and program developers will want to produce it.

SCIENTIFIC PEER REVIEW PROCESS

ESRA requires the Director of the Institute “to establish necessary procedures for technical and scientific peer review of the activities of the Institute” to assure that “scientifically based research standards” are applied, among other things, to the funding of grant applications. The Institute has established a new system for peer review that is similar in many ways to the process of peer review at the National Institutes of Health. A key provision is intended to put distance between, on the one hand, the program officers and administrators within the Institute who administer grant programs, work with grantees, and disseminate the results of research, and, on the other hand, those who are responsible for the peer review of applications for funding under those grant programs.

“Proponents of the reorganization of research responsibilities at the Department of Education should be at least moderately pleased.”

Andrew Rotherham,
Progressive Policy
Institute

To that end, an office for peer review and standards was created and staffed within the office of

the deputy director for science of the Institute. That office selects peer reviewers, determines review criteria, manages competitions, provides feedback to applicants, and generates scores for applications that determine scientific merit for funding decisions. This office also handles peer review of all Institute reports. To support the process of peer review of grant applications, the Institute has created an entirely electronic application submission and review mechanism that is on par with the best available among federal agencies.

HUMAN CAPITAL

More than 30 scientists have been hired to staff and provide leadership to the Institute's programs. The Institute recruited an eminent scientist, Dr. Barbara Foorman, to be commissioner for its National Center for Education Research; a distinguished economist, Dr. Phoebe Cottingham, to be commissioner for its National Center for Education Evaluation and Regional Assistance; and a prominent developmental psychologist, Dr. Lynn Okagaki, to be deputy director for science.

THE CENTERS

The National Center for Education Statistics

Reliable data are critical to informed decisionmaking for improving education in America. Indeed, the initial mission of the first Department of Education created in 1867 was to “collect...such statistics and facts as shall show the condition and progress of education in the several States and territories.” While today’s education and the task of assessing its scope, quality, and impact are immensely more complex, the National Center for Education Statistics (NCES) within the Institute of Education Sciences continues to carry out this core function for the Department and the nation.

As reauthorized by Congress under the Education Sciences Reform Act of 2002 (Pub. L. 107-279), NCES has as its responsibility to “collect, report, analyze, and disseminate statistical data related to education in the United States and in other nations....” To meet this obligation, the Center continually works with its diverse customer groups and relies on their feedback to determine how it can best meet their demands for timely, comprehensive, and useful information that maintains high statistical standards. NCES strives to provide a balanced portfolio of products and services that include data about emerging issues, while still recognizing the need for basic statistical information about trends in educational participation, institutions, and resources. NCES supports a wide range of activities, carrying out a program of over 30 surveys; maintaining a user-friendly, interactive web site; and assisting states and postsecondary institutions in building a solid infrastructure for accurate and timely statistics through cooperative systems with the elementary/secondary, postsecondary, and library communities.

NCES collects statistical data on all levels of education from preprimary through graduate study, including adult education. The education policy issues addressed by its data collections are equally wide ranging, including enrollment trends, access to postsecondary education, the academic achievement of students, comparisons of the U.S. education system with those in other countries, and the impact of education on employment and economic productivity.

Institutional surveys. NCES sponsors a core program of administrative statistics covering institutional-level data on schools, school districts, libraries, and postsecondary institutions. These data are collected through state agencies and postsecondary institutions, and form a basis for conducting sample surveys for more detailed statistics. Elementary and secondary surveys that build on these core surveys include the Schools and Staffing Survey and the School Survey on Crime and Safety. The postsecondary survey program supports such surveys as the National Postsecondary Student Aid Study and the National Study of Postsecondary Faculty. Quick-turnaround surveys on emerging policy concerns are conducted at both the elementary/secondary and postsecondary levels.

Household surveys. NCES conducts a National Household Education Survey covering various education topics, such as early childhood and adult education, program participation, education-related home activities, and parental involvement in education. It contributes to the Bureau of the Census population surveys for annual measures of the dropout rate and educational attainment.

Assessments. NCES conducts the National Assessment of Educational Progress (NAEP), which assesses academic achievement at grades 4, 8, and 12 in a number of domains, including reading, mathematics, writing, science, U.S. history, geography, and civics. Under the No Child Left Behind legislation, NAEP is administered every two years in reading and mathematics, and all states are required to participate in order to obtain Title I funds. NAEP is recognized as the “Nation’s Report Card” for providing timely, accurate, and unbiased information on student performance nationally and in the states. NCES also conducts a periodic nationally representative assessment of adult literacy among the 16- to 65-year-old population.

Longitudinal studies. NCES conducts a program of longitudinal studies, which track educational developments of individuals over time, in the context of a wide variety of educational, social, and environmental factors. These longitudinal studies address a variety of important education issues from early child development through postsecondary education. Issues include factors associated with school failure and success and the quality of education in public and private schools.

International assessments, surveys, and indicators. NCES participates in international surveys of educational achievement and programs to develop cross-national education data and indicators. Working closely with such organizations as the Organization for Economic Cooperation and Development (OECD) and the International Association for the Evaluation of Educational Achievement (IEA), NCES plays a leading role in the conceptualization, development, and implementation of international surveys and programs. Among the international surveys in which NCES participates are the Trends in International Mathematics and Science Study (TIMSS); the Program for International Student Assessment (PISA), a study monitoring the performance of 15-year-olds in reading, mathematics, and science literacy; Progress in International Reading Literacy Study (PIRLS), a comparative study of the reading literacy skills of fourth-graders in 35 countries; and Adult Literacy and Lifeskills (ALL) Study, an international assessment of the literacy skills of the adult population (ages 16-65) in participating countries.

The National Center for Education Research

The National Center for Education Research (NCER) supports rigorous research that contributes to the solution of significant education problems in the United States.

Through its research initiatives and the national research and development centers, NCER engages in research activities that will result in the provision of high quality education for all children, improvement in student academic achievement, reduction in the achievement gap between high-performing and low-performing students, and increased access to and opportunity for postsecondary education.

“Over the past four years, causal questions – questions about the impact of alternative policies and practices – have emerged as priorities in educational research. These priorities are clearly reflected in the research and evaluation agenda of the US Department of Education.”

Stephen W. Raudenbush,
University of Michigan

One of the Institute's major objectives has been to increase the quality of education research. In carrying out that goal, NCER has developed focused research competitions that target specific research questions and research methodologies appropriate to those questions. The number of focused competitions increased from 3 in FY 2002 to 8 in FY 2004; the number of applications received increased from 226 in FY 2002 to 600 in FY 2004, and the number of new research awards increased from 26 in FY 2002 to 46 in FY 2004.

Performance tracking. We established a performance tracking system for our research investments by submitting each year to the same external panel of distinguished scientists a random sample of our newly funded grant proposals for an evaluation of quality. Comparing the base year of 2001 to 2004, there has been a 67 percent increase in funded grants rated as high quality. Because randomized controlled trials provide the most rigorous tests of what works in education, and because our customers are predominantly interested in what works questions, we have also tracked annually the proportion of our funded proposals addressing what works questions that use experimental methods. Again using the year before the new procedures were established as the baseline (FY 2001), the proportion of our funded projects asking causal questions that use randomized trials increased by over 200 percent through FY 2004.

To increase the relevance of the Institute's research and evaluation activities, we have targeted our activities to address the pressing needs expressed by local, state, and national education decisionmakers in our education decisionmakers survey. We have placed a much greater emphasis on conducting research to develop, evaluate, and understand the processes underlying curricula, instructional approaches, and education interventions in academic content areas and in other areas relevant to student learning and achievement. We have also addressed the need for research to develop, evaluate, and understand what needs to be done to increase student learning. To accomplish this objective, the Institute established focused competitions in these areas rather than holding open competitions in which researchers could submit applications for funding for any topic of interest. Eight new focused research programs have been established and are receiving ongoing funding: preschool curriculum; teacher quality in reading; teacher quality in math and science; social and character development; mathematics and science education; school

finance, management, and leadership; cognition and student learning; and reading comprehension. Additionally, in the past two years, research and development centers have been awarded in the following areas: low-achieving schools; choice and innovation; rural schools; assessment, standards, and accountability; and English language learners. Future competitions will target early childhood, state and local policy, and postsecondary education. Using 2001 as the baseline year, the proportion of our funded projects rated as being highly relevant by a panel of experienced state and local education leaders, including superintendents, directors of curriculum and instruction, and chief state school officers, increased by 138 percent through FY 2004.

Interdisciplinary training. Recognizing that there are significant capacity issues within the education research community, we have established a program to fund interdisciplinary research training programs in the education sciences. In FY 2004, five institutions were awarded grants to put together a program across departments (such as psychology, political science, economics, education, and epidemiology) that provides intensive training in education research and statistics. Pre-doctoral students will graduate within a traditional discipline, e.g., economics, but will receive a certificate in education sciences, and will be expected to produce dissertations on education topics. In FY 2004, the Institute partnered with the American Psychological Association to establish new post-doctoral fellowships to provide training opportunities for psychologists in education research. Based on the success of this program, the Institute announced a new post-doctoral training grant program open to education scientists in any discipline to provide opportunities for training young researchers in the education sciences.

The National Center for Education Evaluation and Regional Assistance

The National Center for Education Evaluation and Regional Assistance (NCEE) is responsible for conducting rigorous evaluations of federal programs, synthesizing and disseminating information from evaluation and research, and providing technical assistance to improve student achievement.

NCEE conducts—through grants, cooperative agreements or contracts—studies that will assess the impact of education programs on academic achievement, particularly in reading, mathematics, and science. It reviews selected evaluation work supported by others outside the Department, to assess the quality of studies and the significance of such evaluations for improving education. NCEE sponsors a variety of activities to promote the widespread adoption of rigorous evaluation designs and methodologies in federal and non-federal education evaluation studies.

Rigorous evaluations. A major activity of the evaluation center is identifying which federal programs are effective and which are not. NCEE represents an important shift in the purposes of program evaluation and the types of methodology used in evaluation studies within the Department of Education. In FY 2003, we began a new generation of evaluation studies designed to produce rigorous scientific evidence of the effectiveness of programs and practices. In particular, NCEE focused on conducting rigorous impact studies of promising education programs and practices that are supported through federal funds. The evaluation studies use methodologies that can provide credible scientific evidence to answer questions of effectiveness.

Eighteen large evaluation studies were launched during 2003-2004, including Reading First, Early Reading First, reading interventions for struggling readers in late elementary school, education technology in math and reading, after-school academic remediation, family literacy, charter schools, English language acquisition, professional development, teacher education, teacher induction, adult literacy, school choice, and school-based violence prevention.

Wide dissemination. NCEE released 10 reports in 2003-2004, including high-visibility reports such as the *Third National Even Start Evaluation: Follow-Up Findings From the Experimental Design Study*, and *When Schools Stay Open Late: The National Evaluation of the 21st Century Community Learning Centers Program - Second Year Findings*. In addition, NCEE issued several guides to evidence-based practice, including, *Identifying and Implementing Educational Practices Supported by Rigorous Evidence: A User-Friendly Guide*.

The What Works Clearinghouse (WWC) is NCEE's pioneering effort to synthesize the best evidence of the effectiveness of education programs, policies, and practices. WWC reports on up-to-date research findings available through its web site at <http://www.whatworks.ed.gov>.

All WWC reports are easily accessed, downloaded, and printed from the WWC web site. Users can search the WWC databases for study, intervention, and topic reports. New and updated reports are posted online monthly. Since the WWC's interactive web site was launched in October 2002, it has had more than 4 million visits.

“This [the WWC] really represents a turning point in education, because until now, educators have had to rely on the claims of those who produced the programs themselves or on research that may or may not have followed rigorous design standards. For the first time, they should be able to get the kind of information they need in choosing what to do to make improvements in their schools and classrooms.”

Karin Chenoweth,
The Washington Post

In November 2004, the WWC released the first topic level report and five intervention reports on middle school mathematics curricula, a subject area receiving critical attention because of its importance in state systems measuring school performance. The central finding was that most math curricula have not been evaluated with scientifically valid studies that would produce scientifically valid conclusions about a curriculum's effect on student learning.

The Regional Educational Laboratory Program. Congress created a system of Regional Labs to develop and disseminate—in cooperation with schools, state education agencies, and research universities—ideas and programs for improving education practices throughout the country. The Regional Labs are in the last year of their contracts. Contingent on continued funding from Congress, the Regional Lab contracts will be recompeted in 2005 in the context of the same goals that drive the Institute: rigor, relevance, and utilization.

ERIC. A major accomplishment for NCEE was the March 2004 award of the new contract for the redesign of the Education Resources Information Center (ERIC), the largest education database in the world. The ERIC online system went live in September 2004 and now provides

the public with a centralized ERIC web site for searching the ERIC bibliographic databases of more than 1.1 million citations going back to 1966. In October 2004, ERIC for the first time offered free public access to more than 100,000 archived full-text documents.

The National Library of Education. In 2003, the National Center for Education Evaluation and Regional Assistance appointed a professional librarian as Director of the National Library of Education. The National Library of Education collects and archives information, providing special historical and current collections of Department of Education documents, a collection of journals supporting the ERIC database, research reports supporting the What Works Clearinghouse, and resources supporting current and historical federal education legislation. The overall focus of the collection is education issues, research, and policy. The Library also maintains a collection of government documents, serving as a federal depository library under the Government Printing Office.

GRANT AND CONTRACT AWARDS

The Institute carries out its programs through grants and contracts. The attachment includes all awards made in the first two years of the Institute's existence.

CONCLUSION

The nation needs policymakers, educators, and concerned citizens to see the value of rigorous evidence, to turn to it when difficult decisions arise, and to insist that new policies that can't wait for evidence be tested as they are implemented. That requires a transformation in the way education is conducted. The Institute is at the center of that transformation because that is our statutory mission and there is substantial, bipartisan political support for evidence-based education policy. The Institute has made substantial progress in the last two years. Much work remains and many challenges lie ahead. Our eventual success will depend on the continued support by Congress of the mission and activities of the Institute.