How Relevant Research Can Help Build a Science of Education: University of North Carolina at Chapel Hill and Frank Porter Graham Institute Talk[1]

March 28, 2011

Good afternoon. Thank you. I am pleased to be here and meet so many people who have many long standing connections with IES. As you know, there have been several national research and development centers here at UNC and the Frank Porter Graham Institute. The National Center for Research on Early Childhood Education, though housed at University of Virginia, has a great deal of activity here. UNC has two post doctoral research training fellowship programs, one in early childhood education sciences and the other in special education research. Another side of IES, NCEE is now beginning a partnership with FPG to review single case design studies in the area of autism, following WWC standards.

Sam Odom and I have been corresponding for a couple of months about this visit, and for the whole time I procrastinated about both the title and topic of this talk, but eventually we came up with a grand sounding title, **How Relevant Research can help build a science of education.**

[1] This is a revised version of a talk given at the University of Kansas (March 17-18, 2011).

What I've decided to talk about are some of my goals for IES and how I think IES should move going forward. I'll also describe some of my previous experiences in Chicago so that you'll understand the experiences that influence my thinking. Then I'll selectively choose among several activities at IES to give you a flavor for how things are playing out. I'll end with an attempt to tie these themes together and suggest where I think the education research field ought to be moving and how we might get there.

Before I came to Washington almost two years ago, I spent my entire career analyzing data, researching reform and school improvement efforts, and working with members of Chicago's education community to make those findings useful. The vast majority of these years, I worked with or for the Chicago Public Schools, city's K-12 system. The only exception to this pattern is the few years that I worked for the Chicago City Colleges system, Chicago's two year colleges, when I worked at the Center for the Improvement of Teaching and Learning. Even when I think back to that work 30 years ago, I remember our efforts to conduct high quality research that was useful and relevant to educators.

I am going to talk about two themes and priorities of mine for a bit: making our research and evaluation more relevant and usable; while at the same time building a stronger science of education that helps us understand more about the school improvement process, better teaching, and more student learning and the policies and

practices that we need to put in place to reach these goals. As I and many others often say, education research needs to move beyond trying to discover "what works" to learning about why, when, where, for whom and under what conditions.

Let me tell you about an experience I had a couple of years ago when I was executive director of the Consortium on Chicago School Research at the University of Chicago.

I was presenting data to a group of senior Chicago administrators and principals who had been charged with a formidable goal: Increase the number of high school students graduating with an ACT score of 20 or above—a score that would give students access to most public colleges in Illinois. About halfway through my presentation I showed a complex graph that demonstrated the likelihood of reaching 20 on the ACT in 11th grade based on 8th grade state test scores. I projected an animated power point slide showing the relationship between the 8th grade test score and the likelihood of reaching 20 on the ACT several years later. As you can imagine, as the 8th grade test scores increase so does the likelihood of reaching 20. I pointed to the students who **exceeded** the 8th grade math standard and showed that they had better than 60 percent chance of scoring 20 or above on the ACT three years later.[2] Then I clicked on the animation to highlight the students who **met**, but just barely met, the 8th grade math standard. The graph showed that the probability of scoring 20 or above on the ACT three years later

[2] Easton, John Q., Stephen Ponisciak, and Stuart Luppescu. 2008. *From High School to the Future: The Pathway to 20*. Chicago: Consortium on Chicago School Research at the University of Chicago.

for these students dropped to below 10 percent. What I heard then was a collective gasp. Here was a finding that highlighted the yawning disconnect between elementary school standards and the demand on high schools to produce college-ready students. Here was a finding that swiftly explained why elementary and middle grade scores looked so much better than high school scores. The standards were completely out of alignment. What it did was convince elementary principals that they had a stake in what was happening to their students in high school – that just "meeting standards" (or achieving proficiency) on Illinois' accountability exams does not mean they are prepared for high school work or college entrance exams.

So hearing a room full of school leaders gasp over a complex graph—well, that's a rare thrill for a researcher, in fact, music to my ears. I want other researchers to experience that same kind of thrill, the kind that comes from producing work that guides schools and their leaders and helps improve the lives of our nation's most vulnerable students. (The research itself went way beyond this descriptive finding, but this is what caught the attention of the leadership.)

When I arrived at IES, my core challenge was clear: We need to work more collaboratively with practitioners and policy makers and build partnerships that engender relevant, useful research. This remains my biggest priority—and is still a challenge.

On November 1, 2010, the National Board of Education Sciences approved a new set of research priorities that highlight this need.[3]

> The overall mission of the Institute is to expand fundamental knowledge and understanding of education and to provide education leaders and practitioners, parents and students, researchers, and the general public with unbiased, reliable, and useful information about the condition and progress of education in the United States; about education policies, programs, and practices that support learning and improve academic achievement and access to educational opportunities for all students; and about the effectiveness of Federal and other education programs. The Institute seeks to understand causal linkages to the greatest extent possible by conducting or sponsoring rigorous studies that support such inferences.
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> The work of the Institute is also grounded in the principle that effective education research must address the interests and needs of education practitioners and policymakers, as well as students, parents and community members. To this end, the Institute will encourage researchers to develop partnerships with stakeholder groups to advance the relevance of the Institute's work, the accessibility of its reports, and the usability of its findings for the day-

[3] *Director's Final Proposed Priorities for the Institute Of Education Sciences*, November 1, 2010: http://ies.ed.gov/director/board/pdf/priorities.pdf

> to-day work of education practitioners and policymakers. Further, the Institute will seek to increase the capacity of education policymakers and practitioners to use the knowledge generated from high quality data analysis, research, and evaluation through a wide variety of communication and outreach strategies.

IES is known for its rigor in the evaluations that we conduct, in the research that we sponsor and in the statistical work at the National Center for Education Statistics. We are not retreating from this insistence on rigor even as we push for greater relevance, usability and the coherent accumulation of knowledge.

As you all know, IES has focused much of its research grant program on developing and then validating programs or interventions, in the hope that these can then be scaled up to have broad impacts. Yet, I believe that IES also needs to help the field develop stronger understandings and theories of schools as organizations, how schools and districts improve, and how they become learning organizations. I am not at all convinced that good schools are the sum of discrete programs and interventions. Instead, good schools are learning organizations that value strong leadership; encourage and support innovation; use data for continuous improvement; hire good teachers, support and develop them, and encourage their collaborative efforts; make good programmatic decisions and constantly change, tweak and revise.

I mention these ideas in almost every talk I give and often refer to the work of my friend and colleague Charles Payne, whose book *So Much Reform, So Little Change,* explores why even the most promising interventions fail at dysfunctional urban schools. (As a side note, Charles, a professor at the University of Chicago, is now on leave as interim Chief Academic Officer for the Chicago Public Schools.) His analysis looks closely at schools in highly impoverished neighborhoods that have too much student turnover and too few strong leaders and high-quality teachers. These schools often think they can solve their problems by buying new programs. You know, schools are inundated with salespeople who are selling programs, some of which have a good evidence base, but many of which do not. All too often, these "miracle" programs don't produce a single miracle – because, as we have learned from all these depressing failures, you can't string together a bunch of disconnected programs and call it a school improvement strategy.

My colleagues Tony Bryk, Penny Sebring, Elaine Allensworth, Stuart Luppescu and I worked for about a decade on a research project in Chicago that culminated in a book called *Organizing Schools for Improvement: Lessons from Chicago*.[4] Taking advantage of a natural experiment in the Chicago public schools that was created by school decentralization and by careful and consistent measurement of many variables over

[4] Bryk, Anthony, Penny Bender Sebring, Elaine Allensworth, Stuart Luppescu, and John Q. Easton. 2010. *Organizing Schools for Improvement: Lessons from Chicago*. Chicago: University of Chicago Press.

time, we identified a set of key factors that we assert are responsible for whether schools made consistent gains in student learning over time or not. We call the factors the **five essential supports for school improvement**.

This theory emerged from a parallel set of processes. First were extended local stakeholder consultations following a 1993 report that identified three groups of schools.[5] One group of schools had really embraced the 1990 reform and was using their new authorities and resources to great advantage. A second group showed some signs of these activities. The third group we called "left behind by school reform." This consultation process sought input for a model of good schools in Chicago. Second were reviews of research on effective schools and studies of school restructuring. And third were the direct experiences of many of my colleagues as external change agents working through the University of Chicago's Center for School Improvement. This approach to theory embodies a "practice to research" or "practice-based evidence" strategy, which I believe is a strong complement to the "research to practice" and "evidence-based practice" mantra we hear so often.

Our theory posits that leadership (broadly defined) is the driver for change in the school improvement process. Leadership has its effect on classroom practices and therefore student achievement outcomes by strengthening ties to parents and communities, by

[5] Bryk, Anthony S., John Q. Easton, David Kerbow, Sharon G. Rollow, and Penny Bender Sebring. 1993. *A view from the elementary schools: The state of reform in Chicago.* Chicago: Consortium on Chicago School Research at the Univ. of Chicago.

developing a student centered learning climate characterized by safety and order, by creating and developing professional capacity among teachers, and by providing guidance to the instructional system.

Our study spanned six years in the early 1990's and we replicated it with new data between 2003 and 2009. This study was highly dependent on periodic teacher, student and principal surveys that formed the basis for our measurement system that included key indicators of the five essential supports.

In our study, we found that schools that were strong in one of the five essential supports were between two and five times more likely to show long-term improvements in student achievement gains (as defined by a value-add like model) in both math and reading than were schools that were weak. On the other hand, schools that were weak were much more likely to stagnate in student achievement gains. To give an example, schools that were among the strongest quarter of schools on teacher work orientation (a component of professional capacity) had a 47 percent chance of being among the top quarter of schools in terms of improvement in reading. Only nine percent of schools that were in the bottom quarter on teacher work orientation improved in reading. In other words, schools strong on work orientation were about five times as likely to improve as weak schools.

We still noted that some weak schools did improve, so that we came to view these essential supports as a system of organizational features and concluded that school improvement must be a multi-faceted process. Very few schools that were weak in three to five areas showed improvement in reading; virtually none of those that were strong in three to five essential supports stagnated. In math, no schools that were weak in three to five of these areas showed long-term improvements.

As I mentioned earlier, we posit school leadership as a primary catalyst for change. Leaders set a strategic orientation, they nurture multiple leaders, focus on instructional improvement, and though we didn't measure it in our study, they insure the effective management of school operations. Good local leadership promotes the development of cooperative adult relationships across a school community. Resources do matter for improvements in learning, but even more important is the capacity of a professional staff to work together. Adult cooperative work that is focused on instruction is key. Finally, our evidence leads us to conclude that sustained school improvement is intrinsically a social enterprise.

Let me give you a more specific example of our findings that digs a little deeper into how specific indicators of the essential supports relate to improved student learning. One of my favorite indicators is called collective responsibility, a sub-component of professional capacity. This highly reliable seven-item scale includes questions such as:

How many teachers in this school help maintain discipline in the entire school, not just their classrooms? Feel responsible to help each other do their best? Feel responsible that all students learn? When strong professional community is combined with curricular alignment about half of schools improve, whereas only 4 percent of those that are weak do.

I talk about this research because I think that is nicely reflects some current themes that I hear among researchers. The program theme at this year's recent annual conference of the Society for Research in Educational Effectiveness was: "*Building an Education Science: Investigating Mechanisms*," clearly signifying the need to move from simple "black box" or "silver bullet" approaches to school improvement.

Going forward at IES as we shape our new programs and evaluations, we are asking our funded researchers and our evaluation contractors to better understand educational and learning processes and the mechanisms through which schooling policies and practices affect students. This means looking beyond what works and what doesn't, but "how?" and "why?" and "for whom?" and "under what conditions?" This will require supporting research on the effects of practices and programs on different subgroups of students, testing hypotheses regarding mediating processes and mechanisms, studying the roles of classroom, school, and social contexts in moderating the effects of policies and practices. These issues were the questions raised at the recent SREE conference.

If we are asking our research to answer more complex questions, it also means we must expand our repertoire of rigorous methodologies. Moving forward, I believe IES should investigate mechanisms and moderators using data from randomized trials; allow for the analysis and use of quasi- and non-experimental evidence for studying schooling processes and context; and measure program implementation, fidelity and sustainability. We can apply the same effort to building rigor into these methods as we have to RCTs.

I want to highlight a few examples of what's going on at IES now.

Requests for application from NCER and NCSER.[6] We posted new RFAs a few weeks ago for next year's research competitions. They contain strong language about the importance of conducting relevant research and building partnerships with stakeholders. While this is not required for funding, it is clearly encouraged and one of the criteria for judging the significance of a proposal is based on demonstrating stakeholder input.

RfU. Last year, IES unveiled the Reading for Understanding Research Network, a $100 million commitment that represents a fundamental shift for us and is our largest single

[6] For complete information on the Fiscal Year 2012 NCER and NCSER requests for applications: http://ies.ed.gov/funding/12rfas.asp.

investment.[7] This network is bringing together 130 researchers working in partnership with teachers and school leaders to tackle a critical need: Improving reading comprehension for students from preschool through high school, with a special focus on students from low-income families. These six teams—representing a range of disciplinary specialties including linguistics, cognitive psychology, developmental psychology, reading, speech and language pathology, assessment and evaluation—are working together to rapidly develop instructional strategies, technology, curricula, teacher professional development, and assessments to enable all students to read with understanding.

Almost one year into their projects, teams are already in schools testing initial versions of their reading curricula and instructional approaches for teaching students to understand what they read. During this intense development phase, researchers have worked closely with teachers, school leaders, and district personnel to ensure that the created interventions are easily implemented and sustainable within schools. In addition, teams are beginning experiments to more closely analyze the underlying cognitive processes involved in comprehension. We believe that this project can help transform reading instruction—so that American students can read with the understanding they need to excel in the 21st century labor force.

[7] For complete information on the Reading for Understanding initiative: http://ies.ed.gov/ncer/projects/program.asp?ProgID=62.

We are also asking the grantee teams to work together to create some joint learning and are also exploring how we can learn what parts of these are successful and what not.

i3 (Investing in Innovation) evaluation. As many of you know, last year the department awarded about $650 million dollars to 49 grantees for scale-up, validation and development grants. These grantees are required to conduct local evaluations and to cooperate with technical assistance that we at IES are providing. The goal of the technical assistance is to maximize the number of these evaluations that are well designed and well implemented. But we are also hoping to take this technical assistance one step further to help us understand more about the context and other factors that are related to positive outcomes in the i3 grants. For example, are i3 grantees more likely to make a difference in some environments than in others? Are certain practices or activities the key drivers of effects on youth? We are hoping that this additional layer of evaluation can help us understand more about the science of school improvement. This is the same logic that I hope we can apply to Reading for Understanding.

RELs The National Center on Education Evaluation and Regional Assistance at IES supports ten regional educational laboratories. We recently posted a preliminary notice and statement of work for a new competition for the ten labs in 2012. The primary

mission of the RELs will be to help states and districts systematically use data and analysis to answer important issues of policy and practice with the goal of improving student outcomes. Each REL will build research capacity and a knowledge base in states and districts by:

(1) Assisting states, districts, and schools in using their data systems;

(2) Conducting and supporting high quality research and evaluation analyses that focus on a few key topics; and

(3) Helping education policy makers incorporate data-based inquiry practices into regular decision-making.

The RELs will carry out these priorities primarily by organizing partnerships or networks of practitioners, policy makers, and others in what we are calling "research alliances." A research alliance is defined as a group of stakeholders (Local Education Agencies, State Education Agencies, and others) who agree to work together to use data to learn more about a specific education concern in order to make sound decisions to improve education outcomes. The structure, size, and focus of each alliance will reflect the needs of the region. RELs are encouraged to form regional, cross-state, or cross-district research alliances where appropriate, and/or to partner with existing alliances. Also, the RELs will conduct rigorous research and evaluation studies that may require 3 to 4 years to plan, implement, and prepare analytic report(s).

Among the outcomes that we expect from the labs are:

• Development of a cohesive and potentially deep body of knowledge in core, priority areas for each region and nationally, rather than spreading REL work thinly over many issues;

• Increased use of evaluation, data, and analysis in how officials identify problems, choose programs and strategies, and learn from initiatives;

• Completion of a range of rigorous evaluation and research studies, methodologically appropriate to the questions the studies attempt to answer;

• Expansion of state and local capacity to use their own data, conduct high quality research and evaluation, and appropriately incorporate findings into policy and practice;

• Distribution of REL work across the region, with a transparent and equitable process for REL assistance; and

• Establishment of strong partnerships among practitioners, policy makers, and researchers that are not dependent on ongoing REL support.

Conclusion. I would like to try to tie my two themes together – the need for relevance and usability on the one hand and our need for stronger theories and more cumulative and interconnected research that can answer tough questions on the other. What are those factors and processes that produce positive changes in our schools and classrooms? How do you go beyond "what works" to why, where, when, for whom and under what conditions?

A couple of weeks ago I moderated a panel at the SREE conference I mentioned earlier called "Beyond Impacts: Building an explanatory science of education."[8] The panelists were among the sharpest social scientists you could assemble: Rebecca Maynard, who's now Commissioner of NCEE, Mike McPherson, president of the Spencer Foundation, and Judith Singer from Harvard. I asked them what we needed to do to build this explanatory science and here is a summary of their remarks and comments:

- Build a scientific culture of experimentation in partnership with practitioners and policy makers that may result in more, simpler, quicker and cheaper experiments that can lead to improvements in practice and policy
- Embrace and acknowledge the complexity of teaching and of interventions; learn about how schools and districts operate
- Privilege the substance of research on an equal par with its methods;
- Be more ambitious in substantive theory building and testing; build a careful theory of action to help look inside the black box and try to identify the "active ingredients"
- Conduct more synthetic research; think and work across disciplines

[8] For complete information on the Society for Research on Educational Effectiveness' (SREE) Spring 2011 conference: http://www.sree.org/conferences/2011/program/.

- Build a new professional identity in the education research community– the educational equivalent of epidemiology or engineering

What kind of skills do researchers need for this work?

I'm drawing here from a summary that Catherine Snow made of the skills of researchers at Strategic Education Research Partnership and in other organizations that work in partnership with schools and districts, like CCSR and the Kansas City Area Education Research Consortium.

- They are action-oriented researchers who seek to both generate longer-term knowledge while also providing short or long-term service to districts.
- They use their formidable technical skills to help design studies and refine research questions rather than to create questions.
- They use their complex communication skills to engage with practitioners and policymakers.
- They often begin their work with powerful descriptive data to explicate current practices and outcomes in new and useful ways, building a theory of action around the topic of concern.
- And finally, they recognize the interconnectedness of classroom-level, building-level and district-level functioning so as not to create interventions that ignore these relationships.

I have tried here to lay out two major goals for IES—relevance/usability and stronger theory, and suggest some ways that we are trying to meet them. Thank you for your time and interest and for the major commitments so many here have made to this work.