Draft

Increasing Attention to Evidence:
A Non-Governmental Approach to Scaling Up

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Introduction

I presume we are all here today because we believe that classroom practice must change, and that we must figure out how to take effective practices to scale. By practices, I am referring to the technical core of education (curriculum, pedagogy, and assessment) as well as the professional culture in which instructional practice occurs (roles, norms, relationships). I believe significant changes in instructional practice and culture are essential if we expect our students to be competitive in mathematics and science, and therefore, these changes should lie at the heart of our aspirations for school reform. Coburn (2003) argues that the depth of the changes in practice should be part of our conceptualization of scale, and she contends that to make deep changes, we should be aspiring to change teachers' beliefs as well as their behaviors. I have a somewhat more modest aspiration, or perhaps a more ambitious one, envisioning an education system in which teachers and school administrators consider evidence as they develop their instructional regimes, make instructional decisions that are influenced by the evidence available to them, and alter their practice as new evidence becomes available. I recognize that these individual decisions are influenced by the beliefs, values, norms, and experience of practitioners as well as the information they have had access to. But I believe that with concerted effort, we could alter the balance among these factors and increase the weight that practitioners give to evidence. We should not look at the present patterns of evidence use, and conclude that the future will inevitably be the same.

By scale, I mean that the practices would be adopted in sufficient numbers of classrooms, schools, and school systems, so that they would be become definitive, that is, they would

define the norms of practice in those settings and could be sustained, sustained, that is, until new and better evidence demonstrates that more effective practices are available.

Our national aspirations to have each student leave high school college or career ready, as reflected in the Common Core Standards, require us to shift away from a sorting and selective system toward one in which teachers deliberately and carefully adapt instruction to provide what is required to support each student's efforts to meet standards, and where the standards are defined as representing "proficiency" in core subjects and skills and being at least adequate to give the student a fair chance to compete in the economy, to access further education, and to be a good citizen. It seems clear to me that meeting these goals requires a transformation of instruction at the ground level—a change in the relationship between teachers and students with respect to the latter's learning of particular content and skill such that it is the teacher's responsibility not just to deliver the content but also to monitor students' uptake of that content and to work with them to make sure they learn it and stay or get on track to meeting the standards. Attention must also be paid to how students can be motivated to seek higher level outcomes, and these issues have been fudged somewhat by the rhetoric of high standards for all and the push for greater teacher accountability, but here I am focused on the changes needed in instruction.

Some of the literature on scaling up seems to rest on an assumption that there is a general theory of scaling up that can applied to many types of educational policies, programs and instructional innovations. I think this is a false assumption. My read of the research literature suggests that it matters a great deal whether we are discussing the spread of commercially available mathematics and science curricula and related instructional materials, or of a school-wide design like Success for All, or the use of specific classroom practices such as formative assessment or cooperative learning. Cohen and Ball (2006) note that what we mean by scale depends on the reform being discussed; in some instances, such as new textbooks, curricula, or tests, scale is equivalent with adoption. The tasks and problems of implementation, they contend, vary with the reform.

Admittedly the categories of program and practice overlap, and important practices are contained within programs. Nevertheless, the nature of the change, its scope, and grain-size raise different challenges and questions for scaling up. Mary Kennedy's insightful book about why math and science teachers resist instructional reforms sheds some light on why spreading reforms in instructional practice differs from disseminating new curricula or school designs (Kennedy, 2006). Much of the research and discussion of scaling up reforms focuses on multi-dimensional programs, but today I want to focus on instructional practices or strategies, because I believe that we could improve performance in the schools if teachers would adopt and regularly use practices that have been proven to be effective or are perceived as effective by a consensus of the profession. What am I talking about? I am speaking of lesson design, task selection, cooperative learning, formative assessment and feedback strategies, phonics, direct instruction, study skills, guided student practice, student discussion, explicit teaching of mega-cognitive strategies (reciprocal teaching), weekly and monthly review, and so on.

The States

Should it be the role of government to scale up effective classroom practices? Can government do the job? Can the states scale up instructional reforms? Do we have any reason to believe that agencies of state government could lead significant and widespread changes in instructional practice? What evidence is there that they could undertake such a task? Kentucky and Vermont in the 1990's undertook some significant reforms; in the same period California created an infrastructure intended to change classroom practice; there may be a few other examples. But all of these efforts proved unsustainable and while there was an impact on practice, it faded in most schools. The SSI's funded by NSF in the 1990's challenged states to design and lead reforms in science and mathematics teaching, but they had limited reach and also were not sustained when the funding ran out.

Many state education agencies have lost staff over the past three decades, and this trend is likely to continue. Moreover, most pay lower salaries than school districts in their states and they cannot compete with them for talent. In many states, the education agencies are

not respected by their legislative bodies and exercise only limited influence over education policies. State commissioners and superintendents of education are appointed by state boards of education (25 in 2008), appointed by governors (17 in 2008) or elected directly by the public (11 in 2008); most of them are directly accountable to political leaders, and their policy agendas change rapidly and are seldom in tune with the evidence of what works. In sum, the state education agencies lack the capacity and the independence needed to mount sustained efforts to improve classroom practice. This does not mean, however, that they could not play an important role in developing and sustaining an evidence-based system.

But perhaps most importantly, we should ask ourselves if we want government agencies to determine professional practice in our schools. The hallmark of a professional is they draw upon an accepted knowledge base to serve the interests of their clients. Government could be helpful by supporting the development of that knowledge base and making it more accessible, but do we want government deciding what knowledge counts or how to interpret it? Consider the use of knowledge in designing the Race to the Top program. Is that how we want evidence to be used? And consider the current and future relationships between state governments and teacher organizations; do we really expect teachers will be responsive to the entreaties from state personnel to adopt effective practices? I don't think so.

In the United States we have chosen for better or worse to live in a highly decentralized political system in which no single political body can command all of our institutions to comply. We like it this way. We particularly like it this way in public education which may be the most decentralized of all areas of government activity. That is, we liked it until we realized that we faced serious performance issues, especially in mathematics and science, and then we found that our decentralized, fragmented system of public education was hard to change, slow to move. We cannot simply present compelling evidence to a national legislature or to a ministry of education and then expect all of our schools to comply with the desired reforms. . This is how reform is managed in some countries but it has not been our way of managing our schools. And no matter how much some of us

may long for this kind of power at some moments, is it really what we want? Moreover, what makes us think that centralized decision-making in our political system would produce decisions that were based on evidence?

Most of us want to keep the essential character of our education system, but we also want to see it improve. How can we do that? If our focus is on improving teaching, on making changes in curriculum and instruction, then the critical knowledge we need is not likely to be acquired by granting increased power and responsibility to state or national agencies. Yes, the federal government can support instructional reforms by funding more rigorous evaluations of curricula and instructional practices and making the results known to state and local decision-makers as well as to practitioners. Yes, they can design better funding programs to support sustainable reform initiatives. And, yes, the states can set the content standards, prepare curriculum frameworks, and develop the assessments, and these policies and tools influence teaching. But it seems likely that the hard work of taking reforms in curriculum and instruction to scale will continue to fall on the shoulders of school and district leaders who have both the authority to make decisions about adoptions of reformed practices and are close enough to the classroom to encourage and support their enactment. But this responsibility also belongs to the teaching profession whose members make decisions everyday about instructional practice, and professional organizations should take greater responsibility for guiding their members in how to make these decisions.

I think it is clear that we need to consider an alternative strategy for taking effective practice to scale – a strategy that respects and develops professionalism, a strategy that collaborates with teachers and their organizations to improve practice, a strategy that links teachers to the knowledge base without micro-managing them. Fortunately such an option exists.

The Evidence-based Movement.

In the 1980's there was a growth of interest in the use of scientific evidence to guide policy and practice in medicine, nursing, criminal justice, youth policy, and eventually in

education. What some refer to as the evidence-based movement, and what Robert Granger calls the "scale-up movement" argues that we should do more of what works, and less of what doesn't, and that we will make these determinations more correctly if we attend to evidence. Definitions of evidence-based policy and practice range from narrow perspectives that call for particular kinds of evidence produced by particular social science methodologies (random-controlled trials, systematic reviews and meta-analyses of rigorous studies) to much broader definitions that accept a greater range of methodologies and define good evidence in terms of fitness to purpose (Nutley, S.M., Walter, I, and Davies, H.T.O., 2007). In this broader view, acceptable evidence includes results of efforts to design new tools, monitoring data, expert judgment, codified craft knowledge, and information from stakeholders as well as findings from a range of research and evaluation studies.

Evidence-based policy and practice means using all of the information available to us to help people make better informed decisions about policies, programs, and practices. This is the perspective underlying this paper. Let me be clear, I favor investments in well-designed RCT's, it is important that we continue to invest in rigorous studies of effects, and I think we should privilege rigorous research when we weigh evidence, but I also believe that we can fill gaps in research findings by considering expert opinion and by codifying craft knowledge, and we can use such evidence to adapt research findings to different contexts (Slavin, 2002).

Is the Knowledge Base Adequate?

Some say we do not know enough about instructional practice to provide educators with any guidance. It is said that our knowledge about teaching and learning is thin, often the wrong grain-size, and findings are sometimes confusing or contradictory. I disagree. In the first place, some of these critics are assuming that the only knowledge and evidence that should count are the results of rigorous social science studies such as RCT's. They are important, as Bob Slavin (2002) and others have argued, but in their absence, other forms of evidence are useful and can be beneficial to the profession. Physicians follow practice guidelines that are based in large part on expert judgment, why shouldn't such

evidence be considered in education? Wouldn't teachers benefit from having access to practice guidelines that combined knowledge from rigorous research with the expertise of master teachers? But even if we take the narrower view, clearly we know some things that could make a difference if teachers applied them systematically. John Hattie reports finding over 300 studies of cooperative learning, and by my reckoning, he leaves out a number of rigorous studies (2009). Steve Graham and Dolores Perrine (2007) report on the results of 123 quasi-experimental or experimental studies of teaching writing and their findings show a number of instructional strategies with high effect sizes. And, of course, Black and Wiliam (1998) in their now famous review of formative assessment found over 250 studies worthy of consideration and reported high effect sizes for the regular use of formative assessment in elementary schools. I could go on, but you all are familiar with this work. Furthermore, the systematic reviews now being produced by the What Works Clearinghouse, the Best Evidence Encyclopedia, the Evidence for Policy and Practice Information and Coordination Center (EPPI) in the UK, the Best Evidence Syntheses in New Zealand, AERA's Review of Research in Education, and other sources being developed around the world are providing educators with unparalleled access to the knowledge base underlying their profession. Usable summaries of what we know about effective instruction are available in a variety of forms (see Rosenshine, 2010 for example).

Do we know all that we need to know to help teachers bring all or even most students up to high standards? Of course we don't. Our knowledge about instruction is limited, and in any case, many of the factors affecting learning are beyond the reach of teachers and schools. It is unlikely that we will ever be able to prescribe for a teacher precisely what to do with each particular child who is struggling to read or learn math, particularly those children who some teachers refer to as "enigmas", but many of the problems that teachers face are recurring, common problems, they appear in many classrooms every year: the boy who doesn't like to write; the girl who struggles with fractions; the boys and girls who seem to get stuck at a particular reading level. If we organized what we now know, and perhaps if we simply asked successful teachers what they did when they encountered a particular learning problem, and if we focused our research efforts on these re-occurring

problems, and if we collaborated with teachers in designing and conducting research, surely we could identify strategies that were likely to work when teachers encountered these common problems, and provide them with some meaningful guidance.

What Would an Evidence-based System Look like?

Fifteen years ago, Dick Elmore (1996) argued that taking instructional reforms to scale required the creation of new incentives and new infrastructure. He offered four recommendations:

1. developing strong external normative structures for practice;
2. developing organizational structures that intensify and focus intrinsic motivation to engage in challenging practice;
3. create intentional processes for reproduction of successes; and
4. create structures that promote learning of new practices and incentive systems that support them. (Elmore, 1996).

These were good ideas in 1996, and they still are good ideas. Let's consider each one briefly and in light of current circumstances.

External Normative Structures. Elmore (1996) says that one of the common mistakes of the early education reform movements was depending on the intrinsic motivation of teachers to adopt new teaching methods. He contends when this approach is combined with cultural norms about good teaching stemming from individual traits, and he might have added the professional norm that good teaching involves individual creativity, it guarantees that good practices will not travel well. He argues that most teachers need a stronger motivation in the form of standards of practice accepted by the profession and by parents as well. He argued that new definitions of the good teacher had to be communicated from multiple channels and different sources of authority and had to be reinforced by sources outside the profession. As examples of channels for communicating different expectations about teaching, he offered formal statements about teaching practice from professional educational bodies (like the National Council of

Teachers of Mathematics) and alternative credentialing systems (like the National Board for Professional Teaching Standards). He also proposed less formal ways to communicate good practice such as:

- new curriculum units demonstrating advanced practice accompanied by "how to" videos to teachers;
- internal rewards for engaging in changes in practice such as salary increments for professional development related to the desired changes, time for work on curriculum units or performance standards, and opportunities to participate in demonstration teaching. (Elmore, 1996, p. 140)

"There is no particular requirement for unanimity, consistency, or "alignment" among these various external structures," Elmore writes, "only that they embody well-developed notion of what it means for teachers to teach and students to learn at high levels …" (p. 140). He goes on to say that what is important is that these structures are external to the teachers workplace, that that they influence teachers' ideas about good practice, and they carry some form of professional authority. Elmore didn't mention explicitly the development of practice guidelines along the lines of those used in medicine, but they would satisfy his criteria.

Organizational Structures That Intensify and Focus Intrinsic Motivation. Elmore called for the creation of structures within schools that intensified and focused the attention to good practices and increased teachers' motivation to use them. He envisioned small work units that were characterized by face to face relationships, shared responsibilities, interaction around problems of practice, and a focus on the results for students. He called for more experimentation with structures to see which ones intensified and focused attention on practice and increased teachers' motivation to improve, but warned against creating structures that isolated the timid from the adventurous. We have some examples that illustrate his point: inquiry teams in New York City, some coaching programs, and peer review programs in some districts. Instructional improvement by definition is an internal job and external forces can provide motivation but cannot ensure results. The current workplace/workday paradigm in schools severely

limits internal structural changes. The need for workplace redesign is underestimated. At the most fundamental level, teachers need more time for planning and collaboration, less student load, and fewer instructional hours. Or alternatively a longer day with compensation is needed. Otherwise instructional reforms are unlikely to go to scale because of issues of time and student load.

Intentional Processes for the Reproduction of Success. Elmore offered five theories or models for how exemplary practice could be taken to scale. They are interesting, but none of them really builds off of his insights about external standards and internal social incentives. Two of them are interesting, the concentration of talented teachers in a small number of schools to develop new strategies and what he calls cell division which involves spinning off new schools from successful schools by using teams of teachers from the original school as the founding group for a new school. The latter strategy is being used by some charter management organizations. But these strategies are only indirectly related to the use of evidence to guide practice.

Create Structures That Promote Learning of New Practices and Incentives to Support Them. This recommendation calls for learning through direct observation and practice in classrooms, time to make new practices work, and feedback on how well their students are doing as an incentive for them to stick with the new practice. This is a description of good professional development combined with an interesting use of evidence as an incentive to engage in it. Elmore probably had the learning labs in district #2 or the National Writing Project in mind when he offered this advice, but the evidence on the efficacy of induction programs and mentoring programs supports his insight about how teachers learn best. Cohen and Ball (2006) offer a similar proposal, suggesting the creation of "…networks of continuing technical and professional assistance, including tools, …exchange of usable knowledge for practice, and trouble-shooting…. " to support implementation of ambitious instructional reforms. And now a few new residency programs and induction programs are incorporating the second insight – that teachers will be motivated to sustain a new practice if they see evidence that it works. However, this is not a widespread practice in professional development.

Elmore's proposals are suggestive of what needs to be done to promote the use of evidence to guide instructional practice, but, in my opinion, they do not go far enough. Cohen and Ball (2006) call for the design of instructional reforms that can be used by practitioners who possess modest professional knowledge, lack deep content knowledge, and are unaware of professional standards. They also point to the need for providing more specific guidance to teachers about the use of instructional strategies and the importance of developing tools that will make it easier for teachers to use evidence-based practices, hand-held devices that can help them monitor student understanding for example, and digital archives of lessons that are linked to standards and student entering competencies (For a promising approach to tool development, see Morris, A. K. and Hiebert, J (2011)). State agencies could play a significant role in the development, diffusion, and support for such tools.

Perhaps the most difficult challenge facing those of us who would like to see the teaching profession become more professional and pay more attention to evidence of what works is the development of robust incentives. Elmore emphasizes social pressures by developing professional guidelines and making them available to the public and he suggests linking salary increments to use of desired instructional methods. Evidence-based classroom practices could be stressed in the new teacher evaluation schemes that combine observation with value-added measures. We could go further and require schools to tell parents what classroom strategies are being used and what the evidence is about their effectiveness. Progressive schools often do the first part but seldom attend to the second part. Here again, the states could provide a policy framework which strengthened the incentives for school personnel to attend to the professional knowledge base.

Experience in the U.K. with using research evidence to improve practice in social care, health, criminal justice, and education affirms the ideas discussed above (Nutley, et. al., 2007). The Effective Practice and Organization of Care (EPOC) group within the Cochrane Collaborative, the international group promoting evidence-based practice in

healthcare has developed a taxonomy of interventions to promote evidence-based practice. Based on the taxonomy, researchers have identified seven research strategies:

1. Ensuring a relevant research base;
2. Ensuring access to research;
3. Making research comprehensible;
4. Drawing out the practice implications of research;
5. Developing best practice models;
6. Requiring research-informed practice;
7. Developing a culture that supports research use.

(Nutley, et. al. 2006, p. 128)

These ideas parallel the proposals made by Elmore, Cohen and Ball, and others for increasing use of research in education. I suggest broadening the discussion to focus on evidence rather than merely research findings, but the framework still works. Two of the strategies deserve further comment. Drawing out the implications of the evidence includes preparing practice guidelines and developing tools for teachers; this is an area in which we could make rapid progress. Developing a culture that supports research includes defining management practices, promoting collaboration between researchers and practitioners, creating roles and/or organizations that broker the use of evidence, and supporting intermediary organizations that aim to support evidence-based practice. This is another area in which we have made a start, consider IES's promotion of collaboration, and could do more quickly.

Nutley and her colleagues have reviewed a large body of literature on research use in several fields in the U.K. and found that five mechanisms stand out. These are increasing targeted dissemination, promoting interaction between researchers and practitioners, using experts and other influential people to promote research use, providing technical, organizational, and financial support, and creating incentives to reinforce the desired behavior (p. 132). These are exactly the kinds of actions that Elmore and others have been calling for, and that I am asking us to consider today.

This discussion is just suggestive of what must be done if we were to decide to move toward the creation of evidence-based professional culture. Obviously major changes would be required in the expectations of parents, local and state policymakers, and leaders of teacher unions and professional organizations. Policy changes would also be needed, and resources might be allocated differently. The tasks are challenging, and I am sure that many would argue the challenges are insurmountable. While I do not agree with this assessment, I understand the sources of their pessimism. But what are our alternatives? The two competing visions of the profession that now confront us – a highly regulated system of functionaries who follow pacing schedules and a free market in which teachers jobs are insecure and subject to the whims of ambitious administrators and demanding parents seem abhorrent to me, and unlikely to produce the kinds of educational outcomes we want for our children.

Conditions and Adaptations

Of course, someone will argue that we need to know more about the conditions under which instructional practices work, who they work for, and the knowledge and skills of the teachers who are able to use them effectively. I agree, and we often lack this vital information. Robert Granger has proposed a sensible plan for how we might collect such information for federal and state funded projects in the future by asking for much of what we need to know in the application process (2011). But we cannot wait for the day to arrive when we have all our ducks in a row before we begin to develop the mechanisms that will lead teachers to pay attention to it. In fact, building a strong demand for such information from teachers would be the best way to ensure that we began to collect it.

Would Teachers Respond?

The skeptics are quick to argue that teachers and administrators probably would not use such information even if it were available. They point to older research studies, one on which I was a co-author, showing that research findings have had little influence over local decision-making. As a former state official I can testify to the lack of influence over state policy in the 1970's and 1980's. However, in the 1990's, there was a change and legislators were asking for evidence, and since NCLB, publishers are finding that local

decision-makers are asking them for evidence of effects of their textbooks and curricular packages. I find that when I visit schools, teachers are asking about what works, and I am sure you are noticing this trend as well. The climate has changed. Moreover, consider teachers reactions to the NCTM standards or to the newer document, Focal Points. To me this is promising evidence that many teachers want, and would heed, guidance about instructional practice if it came from respected professional sources.

I wish that I had time in writing this brief paper to examine who was using EPPI, BEE, and similar sources of evidence, and to see if there was an increase in users and particularly if teachers were going to these sites. I suspect that we would all be pleasantly surprised. But in fact, I do not know how teachers would respond to more accessible and readable syntheses of evidence, but if they were focused on common classroom problems and were from respected sources, and we took some other of the other steps described above to provide incentives for them to pay attention to the evidence, I think we would have a much better shot of scaling up good practices than we would by pursuing the mirage of the high capacity state agency.

The Critics of Evidence-based Practice

Many are skeptical of the approach I am proposing, and rightly so, they point to the assumptions I am making about our capacity to increase the amount of usable knowledge available to teachers and to create strong incentives for teachers to pay attention to the knowledge that can be assembled. There are serious challenges, but when I think about it, the work seems doable to me and it offers a vision of a professional teaching force guided by professional knowledge which might help attract good people to teaching and restore the status of the profession. When I consider the alternatives, there really seem to be no other choice. But I welcome responses from skeptics and constructive critics as we need to articulate a set of design principles to guide the development of an evidence-based system of public education.

Yet evidence-based practice seems to attract undue criticism from many people who have stakes in the current system or in the fad-driven approach to instruction improvement that

has dominated public education for fifty years, or who see opportunities for profit and career advancement in the free-market atmosphere which is being championed at the moment. They single out RCT's for attack as though that is the only source of evidence being considered. They suggest that educational research is generally weak, and imply that you can support any thing by assembling research findings. They suggest that teachers are not capable of making sense of the evidence and would ignore efforts to make evidence more useful and accessible. There is a strange blend of anti-intellectualism and elitism in some quarters that resists the idea of attending to evidence. Certainly asking hard questions about evidence might slow the growth of charters, and make the next generation of entrepreneurs work harder, but it could also lead to the reform – or closing - of many teacher education programs and it would give us clearer criteria for evaluating teachers and clearer strategies for helping those who are struggling.

Improving the Knowledge Base

Clearly there are huge gaps in our knowledge about instruction. I do not need to recap the SERP report here. I would argue that IES should pay as much attention to classroom practice as it does to programs, and that there should be a focus on the most common problems that teachers face in teaching the core subjects. I have not given thought to what such a research program might cost, but it surely would be less than the Race to the Top.

Summary

I believe that improving the quality of evidence about instructional practice, enhancing its accessibility, and strengthening incentives for teachers to use it, would result in more evidence-based decisions about the practices, curriculum, and instructional materials used to teach mathematics and science, and that this change would push effective practices to scale and lead to the improved performance of our schools and will benefit children, particularly those who are most dependent on the quality of teaching. I am not an advocate of any particular pedagogy, but a pragmatist who wants our children to have the best available experiences in mathematics and science. I am cognizant of the limited role evidence has played in decision-making processes in the public schools historically (Corcoran, Fuhrman, and Belcher, 2004), but I believe that there is now a promising

opportunity to promote the use of evidence, and I am arguing, we should take advantage of that opportunity and push as hard and fast as we can. While I am aware of the limitations of the available evidence about the effectiveness of different practices, I believe that in the long run making better evidence available will speed up the scale up of effective programs, practices, and materials. Improving access to better evidence and providing better training about interpreting evidence will make for more informed consumers in our districts and schools, and these changes also will help us scale up the most desirable reforms in instruction.

However, the problem of improving practice in mathematics and science cannot wait for the arrival of the large transformations in educational research needed to provide adequate evidence or for the political cultures of schools and school districts to give evidence its proper weight. We need to use what we know now.

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