

MEMORANDUM

UNITED STATES DEPARTMENT OF EDUCATION
OFFICE OF THE ASSISTANT SECRETARY
FOR EDUCATIONAL RESEARCH AND IMPROVEMENT

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TO: Mike Cohen
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FROM: Kent McGuire 
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SUBJECT: Education Research

At the close of last week's meeting, I promised to send you information about OERI's plans for new research activity. This, you suggested, would foster a discussion about how the White House can be helpful in pushing for additional investments in education research.

Let me start by saying that considerable attention has been given, especially over the last 4-5 months, to the research side of OERI. We have moved quickly to get out in front of a number of research planning activities, putting pressure on the planners to speed up and focus their work. Within weeks of my coming into the Administration, we began an effort to review the current research investment. We let a contract to engage practitioners and policy makers in the identification of specific problems of practice and the demand for guidance and support. We met with staff on Capitol Hill to ferret out their perceptions about research in education and to gauge their interests in specific research activities. Hearing a loud critique on the quality of education research, we now have a project focused on research methods in education and the standards of evidence that apply to the study of educational problems. Because we know already that the primary interest of educators and policy makers is in receiving much clearer guidance on matters related to teaching and learning, we have a new project with the National Academy of Sciences to identify how research in cognitive psychology should inform the decisions that people will be making over the next few years about curriculum, instruction, professional development and assessment. This project will also identify specific new opportunities in research, focused on the applications of what we have learned over the last 15 to 20 years.

We have endeavored not to work in isolation. I have been struck by how little interaction there has been in recent years between offices within the Department of Education on matters pertaining to research and development. We are chipping away at this on several fronts ranging from identifying and addressing the research questions that are associated with key Department priorities (e.g., teacher quality, class size, alternative schools, ESEA

reauthorization) to coordinated research and peer review activities. Our relationships with other federal research and development organizations are taking on greater form and substance. In this regard, I believe the so-called Education Research Initiative (ERI) that links OERI and NSF continues to develop substantively and institutionally. There is equal promise associated with the numerous opportunities to partner with NICHD, and we have recently discussed specific collaborations that I will identify momentarily. Finally, we have made considerable progress in identifying strategic affiliations with a number of organizations and associations outside the government. These relationships matter more than some might think because of the constituency they build for research, the visibility they help generate in the education, policy and research communities, and the intellectual capital that is accessed. We are very optimistic about the dividends these partnerships will pay.

We are also exploring how to make our research programs more issue-oriented, with management and monitoring that work collaboratively with investigators and others in the field to reach solutions. This approach requires more rigorous collection of benchmark data, more clarity in identification of indicators, and willingness on our part to terminate projects and programs that do not contribute to solutions. The NICHD approach to RFA's and to research management is one model we are assessing for achieving this goal.

The point is there is a lot going on and we have worked hard and fast to orchestrate a thoughtful march toward a limited range of promising research activities. Both the issues that might command our attention and the ideas about how to go after them are clearer, I suspect, than they have been looking back two or three years ago when standards and assessments so dominated the policy debate.

A Few Examples of Promising Research Opportunities

I have learned how dangerous it is to be too specific in an environment where there are so many agendas -- a virtual competition of ideas about the issues that should command our attention and resources and who, for that matter, should be entrusted with these resources. But you do need reasonably specific examples of the kinds of things it makes sense to do right now. It would also help if you had a few reasons why a given research activity represents a good bet (i.e., what might happen as a consequence of this research?). I have funded quite a bit of research over the last 7-10 years, but always raised the money for it by identifying a problem and illustrating how research fit within a larger strategy for solving that problem. The good news is that there are 3-4 things, around which there appears to be considerable agreement research would make a difference.

For instance, much of the policy work associated with improving elementary/secondary education, initiated under the banner of systemic reform, has proceeded on the assumption that the problem is *national* in scope (not peculiar to a few states or cities) and is related to the very *structure* and *capacity* of the education system (as opposed to changes at the margins). As our attention shifts from developing standards and

assessments to building the capacity of schools to adopt them, there is growing agreement that we will not succeed in getting the achievement results we desire unless we attend *deliberately* and in a *sustained national way* to a series of basic questions. These questions have, among other things, to do with the curricula to which students are exposed, the instructional strategies that should be employed, the assessments that are most appropriate for informing decisions about instruction (and for measuring system performance), how the system is best organized and managed, and what kinds of resources are required (intellectual, financial, etc.) to foster the continuous improvement of the system.

In terms of promising and helpful research, we think that focusing on core content and dealing intentionally with the curricular and instructional challenges associated say with mathematics or reading and English language arts will pay big dividends. This is where the teachers and administrators are asking for help. This is where the new assessments are putting pressure on schools and school systems. This, especially mathematics, is where the U.S. is failing to compete internationally. In short, the demand for guidance is high with respect to research efforts that focus on the core technology of schooling and which hold the promise of helping large numbers of children meet new standards.

This is not the place to present too much detail, but in terms of specific research activity there are a number of pretty obvious targets of opportunity around which we are well down the road in planning. Hopefully, a few bullets will suffice.

- Collaborative work with NSF on improving teaching and learning in mathematics. Last year the President directed the Secretary of Education and the Director of the National Science Foundation to develop an action strategy for using Federal resources to assist States and local school systems in preparing students to meet challenging mathematics standards by the end of eighth grade, and for involving the mathematical, scientific, and technical communities in support of those efforts. The research component of this strategy is yet to be implemented. But this is an example of the kind of work that is possible within the context of the ERI. While there are numerous ways to attack the problem, we are considering a set of large scale intervention studies of different approaches to teaching mathematics. These studies will address many of the issues raised by the recent TIMSS assessments, such as breadth vs. depth in the curriculum, as well as probing the underlying instructional processes that lead to student learning.
- Collaborative experiments with NICHD on reading, especially for LEP students. There has been an on-going discussion between OERI, OBEMLA, and NICHD about the need to learn how children whose primary language is Spanish learn to read English and how we best measure what they know at different stages in their development. These discussions have led to considerable refinements in a planned research design. Both OERI and NICHD have committed to requesting resources in FY2000 to launch such experiments. The NAS synthesis of the literature is helpful in focusing the work to be done, and early political probes suggest there is strong interest in seeing this kind of work proceed.

- Experiments run by OERI to test the results of the NICHD studies and the NAS synthesis on the best ways to teach reading to students who are Native-English speaking but who often have trouble learning to read. There are really two or three issues imbedded in this. There is the matter of ensuring that all children acquire the foundational skills in reading by the end of grade 3. There is the matter of moving toward comprehension and a standard of literacy that is significant – something more than what is currently measured by NAEP. And there is the matter of what might be understood as “catch-up” literacy – helping large numbers of students at the middle and high school levels, who have never been taught to read and for whom there is relatively little guidance or materials immediately available. The work needed here spans both experiments in the traditional sense and design experiments where we are intentional about developing and testing new interventions. Some of this work, especially the work focused on early literacy, is seen as occurring in the context of the ERI. Other aspects might be productively gotten at through the research we envision in the name of comprehensive school reform (since a big challenge there is to extend and refine existing models both by level of schooling and subject matter).
- Collaboration with NSF and NICHD on mapping learning trajectories from pre-school through grade 12. After almost 100 years of educational research we still do not understand how much students differ in their rates of learning or how much is gained or lost in achievement over the summer months, or why the learning-curves for core academic subjects decelerate so dramatically through middle school and high school. These are critical issues for assessment as well as for policy, yet we have limited data for resolving them. New statistical tools and new interpretations of existing data sets give us a base for attacking these problems that did not exist 10 years ago.
- Directed research based on whole-school interventions. The changes we hope for in curriculum and instruction occur in the context of schools, and it is naïve to assume that we can shoe-horn particular instructional interventions into organizations where such innovations will not be welcome. Focusing on whole-school interventions at the same time that we press on knowledge-based innovations in particular subject-matter domains permits opportunities to learn how these practices are brought together to form coherent change strategies at the school and district levels. Current plans call for a combination of implementation studies and design experiments. There are many questions here:

What does a model actually deliver?

How does a given model play out in a range of contexts/settings?

What does high fidelity implementation look like? What does it really take to get there?

Pushing the Frontiers of Technology

Several research planning, evaluation and synthesis activities point to the need for a series of coordinated research efforts focused on technology and its application in schooling. We see a number of specific efforts as very promising.

- Basic and experimental research on the applications of technology to focus explicitly on the nature of learning and student understanding that occurs in technology-enabled learning environments. Examples of such environments derive from math and science investments made by NSF over the past 15 years. All have the same general characteristics of students working on interesting problems and complex topics and doing so in environments where technology provides access to resources, tools for assisting and guiding student activities as well as tools for guiding teachers in managing and using these resources. There are a number of specific questions we need to answer with respect to these new applications before they are likely to become widely used:

What outcomes result for students?

How do they compare with expectations with current curriculum standards?

What do students understand and retain from such learning environments?

What are the issues and implications for teachers and for teacher training?

- Technology-related research that capitalizes on two decades of research and development in cognitive psychology, including work on intelligent tutoring systems, to develop "intelligent assessment systems." These systems would build on the lessons learned from interactive, computer-based systems to support instructional decision making. The most striking consensus in the ERI workshops was that tests and assessments currently used to evaluate student progress and program effectiveness are inadequate. This critique was echoed in the recent evaluation of the National Assessment of Educational Progress released by the National Research Council. The work OERI has supported at the NAS to pull together the best understanding of what cognitive science has to offer (itself a kind of 15-year assessment effort) has led to the specific consideration of the design of more appropriate assessments (a new committee has been formed on the Foundations of Educational and Psychological Assessment). The problem in a nutshell is that much of what we have learned about the nature of students' knowledge and understanding has not found its way into the design of assessment materials and practices. There is a clear need for research and development work that will translate the existing knowledge base into assessment practices that can be used either in:

- large scale assessment programs such as NAEP
- school and district-based reporting systems based on the timely aggregation of individual student data
- classroom-based assessment practices that are necessary to support enhanced student learning.

This work implies a continuum of activities running from basic laboratory work on individual cognition and problem solving to active involvement in real classrooms looking at the ways variations in students' work reflect variations in instruction—over extended periods of time.

- Collaborative work with NSF on technology use and practice. Here we think we can build on the PCAST report by starting one or two real experiments that examine the effectiveness of using technology in classrooms and homes.

There is a great deal more I could get into. More examples of what we need and plan to do. For instance, I really haven't taken the time to get into how OERI should support and encourage certain lines of basic research such as might be conducted to build an effective bridge between brain research and educational applications. Nor have I much elaborated an agenda focused specifically on teachers and teacher quality (though so much of the content—based stuff I alluded to is germane). There is a set of issues, for instance, related to how to improve teacher education.

And there is more to say about how these research efforts are enacted (how they fit within current planning efforts or partnerships). We can sit down about all this if it is really of interest to you.

All in all, I believe that the specific activities I have outlined above, together with those I have mentioned but not outlined, will easily require an investment of \$100 million in the first year. We can begin to cost some of this out in more detailed ways if you believe that would be useful, but I hope this jumpstarts the conversation about the substance of what we want to do.

I was not aware that another meeting was planned for Wednesday. I am sorry that I will not be able to attend.