The Federal Role in Research Funding: Independents and/or Labs/Centers?

This letter is excerpted from a report commissioned by the National Institute of Education, Office of the Assistant Secretary (Scandura, 1984). This support, however, does not imply NIE or USOE endorsement or nonendorsement.

Just as contemporary challenges to American preeminence in technology are rekindling emphasis on mathematics and science education today, Sputnik brought about a vastly increased concern and funding for improving scientific education in the late 1950s. Initially these concerns were centered on mathematics and the physical sciences. In a few years the concern spread to all sciences and later to education in general. Moreover, by the early mid-1960s it became increasingly recognized that little was known about the educational process. Although there were notable exceptions, most research supported under the Cooperative Education Research Act (circa 1959) was concerned with easily measured variables such as class size, method of instruction, and use of computer-based instruction (CBI), TV, and so on.

Flush with funds, a number of initiatives can be traced from this period: (a) a competitively awarded research contracts program; (b) educational research centers and, later, laboratories; and (c) Title I and Title III programs aimed more directly at the practice of education. A substantial portion of these funds was used to support educational technology. However, most of the money later became increasingly concentrated at a few centers and, in some cases, was used to subsidize commercially infeasible efforts in computer-based instruction.

In my view the most productive programs during this period were the small contracts and basic research programs at the Department of Education, including those administered in collaboration with the National Academy of Sciences. At this time a considerable amount of innovative research was begun, much of it breaking ground for contemporary developments.

Although not intended, the establishment of the National Institute of Education (NIE) during the early 1970s led to the near demise of federal support for serious educational research by independent investigators. By the late 1970s only about 4 percent of NIE’s funds were being awarded on a competitive basis (e.g., Farley, 1981; Page, 1980). A disproportionate percentage of available support was (and is) being awarded by congressional mandate on a noneconomic basis to the various labs and centers.

In this austere environment, the limited grant competitions that were held during this period were largely counterproductive. As few as one or two of literally hundreds of unsolicited proposals were funded annually with the costs of proposal writing alone far exceeding the support provided for actual research. Under these circumstances, it might have been far better not to have held the competitions at all.

Another major development of concern involved the efficacy of large-scale curriculum development efforts supported by the Office of Education during the 1960s and 1970s. One might expect that the results of such an effort would have been quickly adopted by schools and/or commercial publishers. As it turned out, very little of this curriculum material was thought to have commercial value and simply never made it to the marketplace or to schools.

In retrospect, it might have been far better to have used support allocated for CBI and curriculum development for the development and testing of a broader range of prototypes. Such an approach, I believe, would have yielded far more useful information at proportionately less cost.

Increasingly during the 1970s and 1980s, some purportedly innovative problems have been proposed for study as justification for federal support. In recent years, the study of cognitive learning, as opposed to performance, and the application of cognitive theory to instruction fall in this category (e.g., Resnick, 1981). The implication of such proposals has been that they are new, challenging, unsolved problems for the future. In fact, there is a large body of research in both areas conducted by independent researchers in this country and abroad (e.g., Ausubel, 1968; Landa, 1974; Novak, 1977; Pask, 1975; Scandura, 1971, 1973, 1977), which has been largely unreported. Needless to say, federal support for secondary efforts of this sort, in my judgment, is indefensible in these days of highly restricted budgets.

Regarding the federal role in instructional technology, Scandura (1984) indicates the following: (a) Technology and particularly low-cost microcomputers have a definite role to play in education in the 1980s and beyond. (b) Although CBI systems have been of variable quality, the last couple of years have witnessed rapid growth in the quality of educational software. (c) While much remains to be done, we have learned a good deal about cognitive learning and instructional processes during the past 20 years. (d) Very little of the software presently available commercially makes significant use of this knowledge base.

Scandura’s (1984) analysis also shows that past patterns of federal involvement in educational research generally, and educational technology in particular, have been less than optimal in their effectiveness. Specifically, the concentration of resources at a small number of R&D centers and laboratories has greatly diminished research competition and effectively robbed the nation of badly needed intellectual resources.

Moreover, recent planning documents released by NIE suggest that, although serious questions are being raised about the lack of research competition, the concept of R&D centers per se still could be sacrosanct. If so, I believe this could be a serious mistake. Given rapidly increasing international competition from Japan and elsewhere, as well as very real constraints on the federal budget, it seems imperative that the role of the federal government in educational technology be reevaluated without preconditions.

These observations led me to the following recommendations:

1. Large-scale development efforts in educational technology may be handled far more efficiently by the private sector. Savings that accrue at the federal level should be reallocated to basic research in instructional technology and to the development of advanced prototypes. The results of such efforts should provide the “seed corn” from which the private sector might draw.

2. Although the long-term payoff of basic research has been proven time and again, the results typically obtained are sufficiently general and the immediate

Educational Researcher
payoffs are so unpredictable in any specific case, that it would be infeasible, and nearly cost effective, to expect significant direct support from the private sector or from state and local governments. The federal government, therefore, should concentrate its efforts in educational technology on those things that can only or most efficiently be done at a national level—specifically research on instructional theory and systems design and the development of advanced technological prototypes.

3. Because the value of basic research is primarily contingent on the worth of ideas rather than simply magnitude of effort, federal support should be directed toward those individuals who propose the most promising programmatic efforts and who have demonstrated the ability to carry such efforts to fruition. Specifically, whenever feasible, a variety of approaches should be funded—over significant periods of time—in contrast to the cyclic faddism, which too frequently has characterized short-term behavioral research.

4. Because of the time and often unproductive effort involved in preparing proposals, federal officials should give more attention to minimizing such efforts and to cost-benefit analysis of the likely benefits of holding “open” competitions when less than, for example, 25 percent of the proposals can be funded.

My observations of practices at other research agencies, such as parts of NSF and DOD, suggest that it is far more efficient, both for agencies and proposers, for the agencies to make preliminary judgments based on brief letter proposals—of necessity with expert opinion from outside the agency. More complete proposals should be requested only if there is a reasonably good possibility of funding. To insure that competitive ideas are evaluated fairly, reviewers at all levels should be compensated for their time and held accountable for inaccuracies or bias in their reviews (e.g., make reviewers known to proposers).

5. Recommendations (3) and (4) assume that Congress will reassign monies currently mandated to centers and laboratories. It must be emphasized that the total amount of federal money allocated for research in educational technology is distressingly small. There are few areas that could have more bearing on the future competitiveness of American society in a technological world. In the absence of Congressional reallocation, the definition of what constitutes a center or laboratory should be modified to place the emphasis on larger numbers of leaner and more competitive programmatic efforts by independent researchers and their associates. Such investigators normally will be scattered at various locations throughout the country.

Joseph M. Scandura
Director, Structural Learning
Instructional Systems Design
and Computer-based Instruction
University of Pennsylvania

References

Update

Announcement—Division E Research Awards
Two awards, one in Counseling and one in Human Development, will be given at the Annual Meeting for research articles published during the preceding calendar year. The following procedures apply to nominations: (a) An article may be considered in only one category. (b) Three copies of the article must be submitted. (c) The articles should arrive at the address below by February 1, 1984. (d) Send the articles to: Edward Kifer, College of Education, University of Kentucky, Lexington, KY 40506.

Conferences and Meetings
The Ninth Annual European Studies Conference will be held on October 11, 12, and 13, 1984, in Omaha, Nebraska. This conference is an interdisciplinary meeting with sessions devoted to current research, research techniques, and teaching methodologies, as well as traditional topics. Abstracts of papers and/or proposals for panels and workshops should be submitted by May 1, 1984, to Dr. Peter Suzuki, Department of Public Administration/Urban Studies, or Dr. Patricia Kelasa, Department of Education Foundations, University of Nebraska at Omaha, NE 68182.

The annual meeting of the American Association of Colleges for Teacher Education will be held in San Antonio, Texas, February 1-4, 1984. The “21st Century: Agenda for Teacher Education” is the theme of the conference, which will feature prominent educators and business and political leaders. For further information, contact Vivian F. Cooper; American Association of Colleges for Teacher Education, One Dupont Circle, Suite 610, Washington, DC 20036, telephone (202) 293-2150.