Star-Crossed NIE Strives for Rebirth

Will its contribution to educational technology put the National Institute of Education on the map?

The National Institute of Education (NIE) has been throughout its 12-year lifetime a small agency with big problems. Wracked by politics, uncertain of its mission, and lacking a strong constituency, the agency—which is supposed to be the federal government's chief sponsor of educational research—has more than once hovered on the verge of extinction.

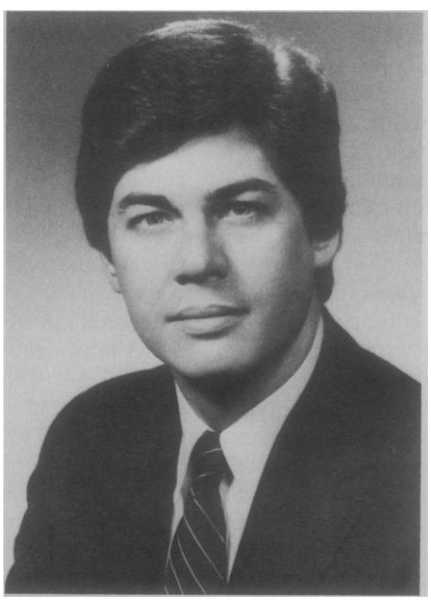
Times have been particularly hard under the Reagan Administration, for despite the national concern over the state of precollege education, NIE's budget has sunk to $48 million and it has had two directors who wanted to abolish it. The third director, Manuel J. Justiz, took over last January, and his first major decision—selecting a location for the new congressionally mandated Center for Educational Technology—came off as something of a bungle when he gave the grant to Harvard University despite the fact that reviewers had recommended Bank Street College in New York (*Science*, 27 January, p. 378).

Nonetheless, despite its turbulent past and reputation for insignificance, NIE's existence is assured at least for now. A modest budget increase has been proposed for next year, and Justiz has raised morale off rock bottom. He is now presiding over an overall shift in NIE's approach to its mission, as well as directing a program whereby the contracts for the labs and centers the agency supports will for the first time be put up for open competition.

Justiz appears to be enormously optimistic about the institute's future, and in particular its role in educational technology. In an interview with *Science*, the 35-year old Justiz, a Puerto Rican–born educator from New Mexico, was extremely friendly, eager, and talkative. Justiz plans to visit all the labs and centers, the first time any NIE director has taken the trouble to do so. The competition, preceded by hearings around the country and advised by a 20-member panel, "is the first time NIE has approached things in such a public fashion," he said.

If Justiz can combine his excitement with political finesse, he will probably be the first NIE director to do so. NIE was launched with a well-intentioned but politically inept director, Thomas K. Glennan, and heavily manned with people fleeing the dying Office of Economic Opportunity or, as one observer unkindly puts it, "zealots and losers." Most of its resources were tied up in a variety of programs deposited there from the Office of Education. The intent was to dispatch these "sick animals" (in the words of education researcher Sheldon White of Harvard) as quickly and mercifully as possible, and use the funds to establish NIE's own research program. The labs and centers program, however, is one animal that has survived with the aid of consistent congressional support, and indeed (to shift the metaphor) has at times appeared to be the tail that sustains the dog. It now takes up 60 percent of NIE's budget.

The program, established in 1965 when the education research landscape was relatively bare, includes ten university-based centers for basic research on topics ranging from cognition to school finance, and seven (formerly ten) regional laboratories to disseminate research and minister to local needs. In practice, these roles have been blurred, and the quality of the work is usually described as "mixed." The labs and centers have been periodically refunded but in 1979 Congress decided that the whole program should be opened to competition in 1984 (this date has been changed to 1985 for political reasons).



Manuel J. Justiz, director, NIE

At present, the competition for labs is expected to begin in June; the centers in the fall. NIE has gone to great lengths to get people involved. In March, it mailed out proposed rules to 3000 state, local, and university education people and received 235 responses—a rate characterized as "overwhelming" for an agency described by Department of Education (DOE) secretary Terrel Bell as "the best kept secret in government." Final criteria are now being sorted out.

The big issue for the labs is redrawing regional boundaries to achieve more equitable coverage (the Southeast and Midwest have no labs). For the centers, the main issue is winnowing down the list of research priorities. At a panel meeting in Washington in May, there was considerable support for establishing centers on postsecondary education (primarily computer literacy and remedial education), social sciences and humanities, and teacher education. An educational technology center for reading and writing—parallel to the new Harvard center on science and math—was also pushed by a DOE conference last year.

Whatever the final decisions, controversial topics will be avoided. Centers have long been regarded with suspicion by conservative Republicans who see them as bastions of liberalism. Under this Administration, certain topics would be asking for trouble. Curriculum reform, for example, has been anathema ever since the battle over the National Science Foundation–developed course, MACOS (Man, A Course of Study), which is still cited in attacks on "cultural relativism" and "secular humanism." Even reading has been politicized by conservatives, who favor phonics as an instructional method.

Observers, including some former NIE officials, tend to be somewhat dubious about the competition. CEDaR (Council on Educational Development and Research, the lobby group for the labs and centers) did not want it at all and thinks the labs should stay where they are since they, unlike the university centers, are pretty much creatures of NIE. Others believe that the existing institutions will just rewrite their project descriptions and be redesignated, so the whole operation will amount to a costly public relations exercise. Justiz emphatically disagrees, pointing out that NIE plans to encourage competition by giving out 60 preproposal planning grants. He

says that one of the main things wrong with the program has been the lack of coordination; NIE wants to develop a way to keep labs and centers in touch with what the others are doing and to disseminate the results—or "get the word out" as they now say at NIE.

The labs and centers, despite their budgetary prominence, are only a fraction of Justiz's overall design for what he calls the "new NIE." He has worked closely with Secretary Bell, and their views are apparently in harmony, unlike Bell's relationship with the last two directors.

Justiz will not comment on the political turmoils preceding his taking office in January 1983; however, they almost sank the agency. In brief, President Reagan—in keeping with his campaign promise to abolish the DOE—appointed two arch-conservatives, Edward Curran and Robert Sweet, as successive heads. Both tried to politicize the research agenda and abolish NIE; both were eased out—Curran is now in the Peace Corps, and Sweet in the White House—through the efforts of Bell. Justiz was selected at the recommendation of the up-for-reelection (but since defeated) Senator Harrison Schmitt (R–N.M.). The institute's budget reached an all-time low of $48 million this year, but the Administration has requested $54.2 million for fiscal 1985.

One of Justiz's major moves has been to appoint four academics to come up with suggestions for bringing the peer review process more in line with successful models elsewhere in the federal government. This action, taken partially in response to the fuss over the Harvard decision, may restore some lost faith and better clarify the role of the director.

Justiz hopes to demonstrate NIE's indispensability in the bureaucratic scene with the handling of his three top priorities, which are being promoted under the banner of "strengthening America's classrooms." They are: improving the use of technology in schools; teacher recruitment and training; and secondary school effectiveness.

The first strike for technology was the Harvard grant (Justiz and Bell were responsible for specifying that the new New England research center be devot-

Classroom Goals Stressed in Harvard Study

The National Institute of Education's selection of an 11-member consortium headed by Harvard University as the contractor for a new Center for Educational Technology represents the endorsement of a pragmatic and goal-oriented research approach rather than an open-ended one focused on exploring the potentials of new technology for math and science teaching. "Most researchers put the technology first," says Harvard codirector Gregory Jackson. They say " 'What can we do with it?' rather than 'what are our educational goals?' "

Another feature of the $7.6-million, 5-year program—not often found in this type of research—is close collaboration between researchers and teachers. The terms of the grant require that 40 percent of the budget in the first 3 years be devoted to classroom-based activities in four area schools.

Four multidisciplinary task forces of researchers and teachers have been set up to address math, science, computer science, and new technologies. Investigators will conduct detailed observations of how students interact with computers, teachers, and subject matter, both in the laboratory and the classroom. The focus of the research program is on devising strategies for tackling "targets of difficulty"—scientific concepts that students ordinarily have particular struggles with, such as the difference between heat and temperature, the problem of word problems (in math), and the formulation of hypotheses.

Judah Schwartz of the Massachusetts Institute of Technology (MIT), who is codirector of the new center, emphasizes that the "difficult ideas are pedagogical, not technical." By illuminating the reasoning and assumptions that prevent students from grasping new concepts, the group expects to be able to specify appropriate instructional modes ranging from simple drill and practice to programs enabling the individual to create and solve his own problems. Clarification of these issues is also expected to help teachers learn better the subjects they teach.

Not everyone agrees with Harvard's approach. Seymour Papert, an internationally known computer scientist at MIT who is something of a maverick (he blocked Schwartz's proposal for a Harvard-MIT coalition), dismisses the project as "irrelevant." He does not even like his own proposal to NIE* which he thinks catered too much to its "reactionary" approach. He says Harvard's team lacks sufficient technical expertise and is working with "obsolescent" hardware. Papert, who developed LOGO, a creative problem-solving program for young children, believes that open-ended exploration of the technology can lead to dramatic changes in curricula by enabling children to learn certain concepts years before they are now considered ready for them.

According to the Harvard prospectus, this kind of emphasis on independent discovery—"every child his own Newton"—has already proved impractical. The Harvard group is trying to chart a course between the LOGO approach and routine applications of computer-assisted instruction which have "typically discounted the utility of discovery, experience, and intuition." As for the technology, Schwartz acknowledges they are working with "steam-driven computers," but he says that will not hobble the pedagogical research. Besides, newer technologies will be addressed in another component of the study which will look at the educational potential of the next generation of microcomputers, videodisc, microcomputers used in concert with television, speech synthesis and recognition, electronic networking, and teleconferencing. In this case the "transforming potential of new technology *will* be the starting point."

The fundamental premise, though, is that "schools need help now . . . far more than they need visions of 21st-century information utopias." Or as Schwartz says, "You have to think first before you run off to your next millennium."—**C.H.**

*MIT and Bank Street College of New York were the other two finalists in the competition. Bank Street is disputing the award and will say nothing about its research proposal pending a decision by the General Accounting Office. NIE documents indicate that as far as substance is concerned, Justiz concluded that Bank Street's approach to math was too theoretical and Harvard had a better understanding of curricular issues.

ed to educational technology). The Harvard program (see box) embodies the NIE philosophy that research must be heavily classroom-based and involve close cooperation between teachers and researchers. Detailed plans have already been made for the disposal of the $6 million in new money expected next year—most of which will go for research on computer-aided instruction. Justiz wants to fund investigations that will look at such topics as optimal computer-student ratios, how technology affects classroom organization, the role of home access to computers, and the potential dangers of a computerized classroom.

Justiz has brought in a special aide for technology, Paul Resta, also from the University of New Mexico. One of their research aims is to develop prototypes for high-quality software, particularly in science and math. Here, they are making the Republican assumption that with good models, private industry will pick up the ball and run with it. Some observers, however, are pessimistic. They say that 97 percent of commercially produced educational software is drill-and-practice material or poor quality stuff requiring low levels of interaction. Good programs are expensive because they are manpower intensive. Because, so far, the home computer market has raced way ahead of school demand (10 million as opposed to 325,000 in the schools), most quality educational software is Sesame Street-type material designed for home use and cannot be integrated into existing curricula.

This problem may be addressed by the other aspect of Justiz's technology thrust, which is public-private cooperation in educational technology, to be achieved with the formation of a national study group that will be heavily weighted with executive officers from high-tech industries. This group will be responsible for opening up communications with educators, looking at education-related developments in industry and informing industry of school needs. NIE is also working on getting a high-tech executive donated to it for a year.

NIE has also given the National Research Council $100,000 to set up a committee, headed by James March of Stanford University, to come up with a research agenda on precollege math, science, and technology education. This will include an examination of available information on the use of computers in school settings.

Justiz has big plans as well for his other priorities, which could lead one to wonder if he is counting on a loaves and fishes phenomenon. The teacher program has first priority after the technology program, and the aim is "research-based reform" of schools of education. One million dollars is to be devoted to a pilot project to introduce research findings into teacher training. Combined with new research on what makes secondary schools effective (there is good information on elementary schools, but high schools remain a mystery), these initiatives, Justiz claims, will address most of the main issues in today's education crisis.

Justiz sees NIE as playing a "very important" part in the federal role vis-à-vis educational technology. In some respects it is, of course, overshadowed by NSF with its older programs and larger budget ($55 million for precollege science and math). However, NIE, with its involvement in learning research and with all the major elements of school systems, approaches the problem from a wider angle.

"There is no intellectual debate on educational research—purely hard politics."

Ironically, precollege education is probably the last noncomputerized holdout in the information sector. School systems are conservative, they do not have much money, and they are wary of fads, having seen visual aids, new math, teaching machines, and open classrooms come and go. The amount of research required to optimize the use of new technology is truly stupendous, making NIE's contributions a drop in the bucket. Most courseware is little more than what is called "electronic page-turning." Manufacturers must be persuaded to produce, and schools taught to select, teaching materials that allow students to control the technology rather than vice versa. Equity problems exist at several levels: students with computers at home have the advantage over their peers; inner-city schools tend to choose drill-and-practice programs over the more challenging material selected by suburban schools; boys are more attracted to the technology than are girls. Little is known about optimal classroom organization, or the social and cultural ramifications.

At present, it is not apparent that any federal agency will be assuming the leadership position in a federal strategy to promote research and dissemination of educational technology. Although a slew of reports has been raising broad questions about the appropriate function of education in today's shifting economy, Administration officials take the position that the government's job is to provide knowledge from research, and the market will take care of issues such as getting teachers trained, assuring equitable distribution of hardware and software, and producing high-quality courseware.

NIE, with its roller coaster budget and fast-moving succession of directors, has never had a chance to formulate or enact a long-range educational research strategy. It has been compelled to conform to ever-shifting areas of public concern. What's more, the institute, although now within DOE, retains a separate identity which means it has pretty much failed to cultivate a constituency of the "school people," who tend to be interested in programs with direct relevance to the classroom. Higher education groups, with the exception of the American Educational Research Association, are not interested because the research is directed at precollege schooling. David Cohen of Harvard sees NIE as sitting naked and vulnerable to attack without any real protection from its parent agency. Cohen observes that educational research is "soft" research which, unlike social and behavioral research in health, for example, is not attached to a hard science endeavor. People often see the enterprise as unimportant because it does not come up with hard science-type breakthroughs. Furthermore, education has always had a low status both in research and practice. Finally, it is a highly political field in which short-term fads have too often dominated research.

For these reasons, many observers are pessimistic that NIE, no matter how brilliant its leadership, will ever attain a stature appropriate to the size of the national education enterprise. One DOE official says: "there is no widespread agreement on educational research. No intellectual debate—purely hard politics."

Justiz refuses to let any of this get him down. He believes most of NIE's problems lie in its failure to cultivate a constituency and to disseminate the knowledge it has generated. Both these problems are being addressed in every program the institute is involved in. Aggressive efforts are being made to reach out to educators and the public through newsletters describing research, and pamphlets for parents. "I'm really excited about this place and I really believe in it," says Justiz.

—CONSTANCE HOLDEN