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ABSTRACT

Education research is, or should be, the systematic investigation and solution of critically important problems affecting what and how children learn. This is a complex undertaking, given the size and complexity of American education. Critically important educational problems can be dealt with by supporting a systematic, national effort to examine problems scientifically, develop and test solutions, and see to it that the final results reach those who can make use of them. However, research in education poses problems very different from those in the physical sciences. Often a good research program will develop useful curriculum materials that produce demonstrable results, only to have the socioeconomic population change drastically with the result that materials and techniques that were designed specifically for one population simply do not work for another. Educators need to revise their expectations of what the educational system can do and admit that families, churches, neighborhoods--in fact, the entire range of factors that form an individual's environment--have a critical role to play in the total development of the young. It is important that educational research and development be linked more directly to the world of practice. There is now a strong acceptance of the proposition that the teacher, the school administrator, and even local citizens must be involved. The National Institute of Education sees such a partnership as a mandate for cooperative effort. State departments of education, local school systems, and professional associations should be indispensable colleagues in any federal effort to improve education. (JD)

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Why Education R&D?

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Why Education R&D?

The director of the National Institute of Education talks of problems that vex education researchers and believes that a breakthrough is close at hand.

By Harold L. Hodgkinson

Research and development is one of the most misunderstood and neglected elements of American education.

When a discussion turns to education R&D, the picture that often comes to mind is that of a professor sitting in an office, surrounded by piles of obscure journals and perhaps talking to himself as he writes a scholarly dissertation. This image of the "ivory tower intellectual" is all too easy to conjure up. It's also far from accurate.

Education research is, or should be, the systematic investigation and solution of critically important problems affecting what and how our children learn. This is a complex undertaking—given the size and complexity of American education. Close to eight percent of America's gross national product—$119 billion per year—is invested in education, and it is the major occupation of more than 62 million people. Considering the plethora of vocational training, adult education, and enrichment programs available in addition to traditional schooling, the pursuit of education is probably the Nation's foremost business.

Our educational system is, in many ways, second to none. This is not to say that it is perfect or, in some respects, even satisfactory. Despite our best efforts to date, the following situations prevail:

- Employers complain that many high school graduates cannot read or write well enough to function effectively on the job.
- Many children are denied equal education opportunities because the language they learned at home is not the language used in the schools.
- Many students leave school without the knowledge or skills they need to choose and pursue a career.
- America's schools are caught in a crunch of rising costs, declining enrollments, and constant demands for better performance.

At the same time, more and more students of all ages are questioning the real worth of education. Where, they ask, is the motivation to do well in school, to acquire post-secondary degrees, when a street sweeper in California makes $13,000 a year and an assistant professor in that State's college system makes $12,500? It's become obvious that education is now only one of a number of routes to economic security.

These problems are critically important, and the Nation cannot deal effectively with them on a stopgap, local basis.

But the Nation *can* do something about them by supporting a systematic, national effort to examine problems scientifically, develop and test solutions, and see to it that

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the final results reach those who can make use of them.

This process of scientific inquiry into educational problems extends more than 100 years into the past. Scholars like Henry Barnard, William James, John Dewey, and Edward L. Thorndike are as eminent in the field of education as are Joseph Lister, Alexander Fleming, or Jonas Salk in the field of medicine.

However, research in the social sciences and especially in education poses problems very different from those in the physical sciences. Perhaps the most obvious are in development and evaluation. The research engineer designing Detroit's newest car has a definite advantage over the social scientist developing a new reading curriculum. That prototype car can be given a field test and evaluation rather quickly (perhaps by simply driving it down the road); if it falls apart or won't stay on the road, it's obvious that there is something wrong. If it works, the Detroit engineer knows he has a worthwhile product. He also knows that when the car comes off the production line, it will fulfill an existing demand.

But the social scientist faces several pitfalls. Not only is it often harder to evaluate the long-term effects of his product, but its usefulness hinges directly on the stability of the target population. All too often a good research program will develop useful curriculum materials that produce demonstrable results, only to have the socioeconomic population change drastically. After what may have been a five-year research effort, the researchers are left with a variety of materials and techniques that were designed specifically for one population but simply do not work for another.

Then, too, the payoff and impact of successful research efforts in the physical sciences can be far more immediate and spectacular. The search for a cure for polio took decades, even though it was a multimillion-dollar effort involving hundreds of scientists pursuing thousands of different lines of inquiry. Yet the final payoff was worth that investment: The Salk vaccine has made the incidence of polio in this country almost nonexistent.

America puts $119 billion per year into education, which is the major occupation of more than 62 million people.

The success of post-World War II research and development in the physical sciences led to a growing faith in R&D as an effective instrument of social progress. This optimism reached its peak in the early 1960s, with a huge upsurge in support for social action programs. The Office of Economic Opportunity was created to eradicate poverty in this country; programs like Head Start, Upward Bound, and Follow-Through were created by very optimistic people as a rapid way to equalize educational opportunity.

Because of this deep emotional commitment, the sponsors of such programs were not entirely receptive to research evidence that might throw doubt on a program's success. Most of these social action programs, therefore, did not build in an adequate research or evaluation component but rather tacked it on later.

The mixed success such programs achieved indicates that there are few easy solutions to educational problems. For all of the optimism and resources invested in massive social action programs, most problems are still with us. It simply isn't possible to design a single method of instruction, or a single textbook on mathematics or grammar that will work for all students.

Research in the social sciences, especially in education, poses problems very different from those in the physical sciences.

Too many people still tend to look at education research and say it isn't useful because instead of simplifying the problems it only makes them more complicated. In medicine it is acceptable to have 50,000 people working on a cure for cancer; that means that we've got 50,000 chances of finding a cure. However, to support 50 different approaches to solving the problem of why some youngsters can't read, is, to many people, a waste of effort and money.

There is also a question of time, a far more critical factor in the social sciences than in the physical sciences. The electronic heart pacemaker, for example, took 32 years between the original conception of the idea and the first workable model. That sort of time lag in most of the social sciences would likely make the final product worthless.

There's a strong tendency to believe that education research should be able to produce cut-and-dried single solutions. Unfortunately, it is rarely that easy. For example, it is not difficult to find two schools in the same area serving the same type of population that nonetheless have entirely different problems. The schools may offer identical curriculums, yet one may have tensions and severe discipline problems while the other operates in peace and harmony. Something must account for that difference, but what? By studying only what goes on in the schools, the chances are that it will never be uncovered. Educators—researchers included—need to revise their expectations of what the educational system can do and ad-

mit that families, churches, neighborhoods—in fact the whole range of factors that form an individual's environment—have a critical role to play in the total development of the young.

It's equally important to think about what the function of the school really is. Willard Waller, one of the first educational sociologists, described the school as a "museum of virtue"—a place to exhibit all the virtues that nobody wants to practice anymore, but that everyone feels are somehow important. Sociologists usually split the school's functions into two: the manifest functions (to teach our children, to improve their character, to serve as a social hub) and the latent functions (to introduce youth to competition, to keep youth out of the labor market, to select the meritorious and weed out the unfit, to serve as a juvenile detention center for those who don't seem to make it very well in society, and, by bringing young folk together, to convenience matchmaking).

Every organization has such manifest and latent functions. In order to change or improve them, we must first be able to identify them. One of the responsibilities of education research must be to place schools in a realistic perspective as a part of a total environment affecting what children learn, how they learn it, and what kinds of values they place on particular types of knowledge. Education research is just beginning to produce studies on this. One of the most significant of recent findings in higher education has to do with the importance of a student being in a residential atmosphere. It's quite clear that such an atmosphere is critical in helping people develop in terms of self-reliance, initiative, and basic maturity.

Again, it's a matter of considering the total environment of the student rather than simply an isolated portion of it. To assume that there is only one aspect that need be considered is to miss a great deal of the picture.

For a good many years, education research was almost exclusively involved with the psychology of learning. From Skinner's studies in the 1930s to Thorndike, Lindquist, Tyler, and Maslow, psychologists tended to be the leaders in education research. This leadership has given us important new information about how organisms learn new things and a few insights into how they adapt to their environments, but it hasn't told us that much about why some things take place in and outside the school and others don't.

It isn't possible to design a single method of instruction or a single textbook that will work for all students.

Political scientists are just now beginning to get into educational questions. Texts on education organization and administration are being written by political scientists, and that's a big change. History, anthropology, and sociology are a few of the other disciplines that have a great deal to offer education. But it's a slow process. A look at people who have been trained as education researchers in schools of education will indicate that about 85 percent of them still are psychologists. We need more of a balance.

It's also important that we link education R&D more directly to the world of practice, to what's actually going on in schools. In the past, education research has been charged, perhaps justifiably, with "tunnel vision." To many education policymakers in the early 1960s, education change took place in a relatively linear fashion. Basic research was conducted on problems posed largely by the current state-of-the-art in a particular discipline; the results of that research were then applied to develop products; and the final products were delivered to the schools, which would faithfully adopt them.

This view projected a rather passive or compliant role for those in the schools, both in deciding what problems should be addressed and in developing solutions. That's a highly unrealistic view, and one that is rapidly changing. The elitist notion of several years ago that research could be done only by highly trained scholars is no longer supportable. There is now a much stronger acceptance of the proposition that the teacher, the school administrator, and even local citizens must be involved, and in fact, are likely to have some good ideas about how research can improve education.

When the National Institute of Education (NIE) was created in 1972, its four-part Congressional mandate essentially gave the Institute the leading Federal responsibility for studying the most critical problems in education and helping teachers, school administrators, and education policymakers determine the most promising solutions and apply them in the schools. We at NIE see that mandate as a partnership. We are firmly convinced that State departments of education, local school systems, and professional associations should be our indispensable colleagues in any effort to improve education. We believe that they must be involved, not only in disseminating the final product, but also in setting the research agenda and conducting and evaluating the work itself.

This is not an easy task, especially when the Nation commits less than one-half of one percent of its total education expenditures to efforts to find out what works and what does not. By way of comparison, agriculture spends 3.2 percent of its total resources on

research and development, and health spends 3.6 percent.

To bring about the most effective research payoff possible within the means given it, NIE has concentrated its efforts on five areas of particular importance: basic skills; educational equity; education and work; school finance, productivity, and management; and the dissemination of research results and innovative practices. These areas were by no means random choices. They reflect several years of planning sessions, meetings, conferences, and the like involving NIE staff, chief State school officers, teachers, school administrators, education researchers, and policymakers at all levels. They further reflect the expressed intent of Congress that our activities be "goal oriented," emphasizing the dissemination of research and development results to those in the schools.

Of course, involving all sectors of the education community isn't that simple. In this country there are more than 18,000 bodies responsible for making decisions about elementary, secondary, and post-secondary education. By way of comparison, there is only one decision-making body for education in France.

Which is more efficient? Perhaps the French, on a day-to-day basis. But the type of pluralism we have allows us to adapt or adjust the system far more quickly when there's a crisis.

On the whole, I think we in America are better off, even though our number and variety of policymakers make jurisdictional conflicts endemic. Teachers, superintendents, parents, principals, school boards, State legislatures, State boards and departments of education, the courts, and the Federal Government all have a voice in what goes on in any given school on any given day. And all have views—sometimes very conflicting—about what education is and should be.

An examination of public opinion polls, such as the 1972 Harris poll, will show that Americans' faith in many social and political institutions has dropped noticeably since 1967. Nor have industry and the professions escaped this loss of confidence. Certainly the education system has come under strong criticism.

People are unhappy; they want more control over their lives, and one of the areas in which they have the best chance to get it is in the education of their children. This has made parents a much more vocal group than ever before as is evident in the disputes over busing, in the increasing numbers of school bond issues that are voted down, and in the growing desire on the part of many people to somehow go "back to basics." This "back to basics" drive doesn't necessarily mean that people want to give up the things they like about contemporary public schools. It's more of a yearning for that safe, clean, pure environment that never was, but that people think they remember.

But parent participation is not a fad. It is going to be an increasingly important aspect of education decision-making over the decade. Parents will be holding educators increasingly accountable for the type and quality of education their children receive.

This makes NIE's role all the more critical. Some of the programs now under way at the Institute have a tremendous potential for improving education. For example, the Education Amendments of 1974 authorized NIE to conduct an intensive study of the effectiveness of compensatory education programs, including the $15 billion Federal investment in programs for disadvantaged children under Title I of the Elementary and Secondary Education Act. This will be

the first comprehensive study of compensatory education and should provide some very important information about the kinds of schools or school programs that successfully deal with the problems of underachieving children.

The Institute is also developing appropriate instructional goals and curriculum materials for bilingual education. An estimated five million students in this country come from families in which English is not the language used at home. To date we know very little about the social and cultural processes influencing these children, which suggests that this research has considerable payoff potential.

In the next few years, we should also have a much better idea about at what stage of their lives people make career decisions, and what triggers those decisions. People used to think that, at age 18, a high school student would magically decide to be a doctor or a lawyer or a garage mechanic. Now it is clear that career possibilities are bouncing around in people's heads almost from birth; this makes it very important to know more about the whole sequence of events that produces a career decision. Regardless of whether it's at age two or 55.

Finding the solutions to these and other problems will not, of course, make education perfect, or even as good as it should be. I don't believe that will happen until some kind of common vision for the education system as a whole is developed. I am, however, convinced that the vision may be just around the corner, and that it will be based on the provision of a quality education for every American regardless of age, race, or sex.

We have at our disposal today the technical and economic means of making it a reality. And right now we are gathering the knowledge needed to put that vision into effect. It's a matter of choosing to do so and committing the necessary resources to the effort. □

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