The Place of Research

"RESEARCH is failing the education system because it does not have a direct impact in the classroom where teacher and students interact." Although not a direct quote, that is in essence the statement being made by many educators. James E. Allen (1969), former U.S. Commissioner of Education, said it when he reported that two-thirds of the nation's schools are unable to identify even one advance in practice that they can attribute to recent educational research and development. Stephen K. Bailey (1969) of Syracuse University said it when he stated, "First, educational R & D efforts to date have been intermittent and diffused, and have had little, if any, perceptible effect upon educational behavior." Hundreds of practicing educators have also said it.

Has research failed the education system? Have the millions of dollars of research funds been spent for naught? This paper argues that the answer to both of those questions is a resounding "no" and, further, that those answers provide the basis for improved understanding of the research process and other processes that involve empirical techniques.

The answer to those questions is based on three points expanded in the discussion which follows. First, the questions are, in fact, the wrong questions to ask. Second, for too long research has been equated with measurement and analysis. Third, the system for improving our educational capability, of which research is a component, is an incomplete system.

The Wrong Question

The intensity with which the productivity of research is questioned indicates that most educators have an inappropriate expectation of the research process. Those individuals expect research, first, to produce explanatory descriptions of every educational event, and second, to produce the correct way for that event to occur. Shulman (1970) characterizes this when he indicates that, to some educators, "... the goal of educational research is significant improvement in the daily functioning of educational programs."

What is the product of the educational research process? The answer to that question resides in the nature of the research process. Research is a combination of elements and techniques designed to accumulate knowledge, to add to society's knowledge bank. The elements and techniques used in education for this purpose can be traced almost directly to those in the basic sciences. Thus, the purpose of educational research is the production of generalizable knowledge, the production of "truths" about education that have applicability across space and

1 The quotation marks on the word "truths" are a recognition that the quality of knowledge produced by research is directly related to the quality of the empirical tools at our disposal.
time. Cronbach and Suppes (1969) make this point clear when they describe two types of inquiry, conclusion-oriented and decision-oriented inquiry. Research is their first type, conclusion-oriented inquiry. It is undertaken to produce knowledge that is generalizable.

Control of variables is one of the central elements of the research process, because of the complexity of the phenomena being studied. In all areas under investigation a large number of variables contribute to the nature of an observation. It is almost impossible to arrive at a clear conclusion if all of these variables are uncontrolled. This is what is involved in physics when the statements "friction notwithstanding" or "constant pressure" are made. In those instances the physicist is saying that the relationship between two (or more) variables is X, if other variables are controlled.

In the greater complexity of educational research, the control of mediating or extraneous variables is even more important. Attention to this element is what is happening when an educational researcher controls for intelligence, socioeconomic status, or teacher zeal, as he attempts to make a statement about an instructional treatment and a learning outcome. Conclusions from such studies do not predict that a learning outcome of such and such magnitude will occur in every instance of the use of that instructional treatment. Rather, those conclusions state that in general and if other (controlled) variables do not affect the outcome, treatment X will cause learning Y.

In the individual classroom, the spot where the detractors of the research process say it has failed, the luxury of control does not exist. No teacher can rule out intelligence as a factor in the effects of a teacher-learner interaction. No administrator can rule out the effects of variation in teacher zeal in the operation of a school system. Thus, the conclusions of a methodologically sound research effort cannot be expected to describe a specific educational situation.

This situation is not representative of a failure of the research process. Rather, it is indicative of an inappropriate expectation of the research process. Research can and does contribute to generalizable knowledge. Its object, as Shulman (1970) suggests, "... is the development of coherent and workable theories...." To demand of research a direct impact on educational practice is to demand that all possible combinations of variables be specified. Such a demand is a turn away from generalizable knowledge and toward situation- and time-specific information. Such a demand cannot be met through the elements and techniques of the research process.

To ask if research has failed education because of a failure to have a direct impact on educational practice is, therefore, to ask

* William J. Gephart, Director of Research Services, Phi Delta Kappa, Bloomington, Indiana
the wrong question. The research process produces general knowledge that is an accurate description if certain conditions are met. It is not a process for description of all the aspects of each educational event.

Research Is More Than Measurement and Statistics

The second point on which improvement has occurred in our understanding of educational research centers on the role of measurement and statistical analysis in the process. For a long time instruction in advanced graduate programs in education has seemed to equate research with measurement and analysis. Courses on the research process concentrate almost exclusively on these two topics. In fact, the advanced research design courses in most doctoral programs are almost totally concerned with statistical analysis procedures.

Measurement and statistical analysis are techniques—techniques that are a component of, but not all of, the research process. This assertion is based on two points. First, as experience with the research process accumulates, other components of that process become visible. Second, as experience with other processes accumulates, it becomes obvious that measurement and statistical analysis are component techniques for processes that do not produce generalizable knowledge.

Smith (1964) analyzed proposals for research submitted to the U.S. Office of Education. His findings make clear the fact that research is more than measurement and statistical analysis. The vast majority of the proposals that were submitted were ruled unacceptable not because of measurement and analysis shortcomings, but because of failures in the problem identification and delineation component of the research process. Shulman's (1970) examination of the status of educational research supports Smith's findings. Shulman asks for a reconstruction of research strategy dealing with epidemiology, grammars of behavior, simulation, longitudinality, and replicability. In so doing, he is focusing attention on the problem component in educational research.

Research has another component that is neglected if research is equated to measurement and statistical analysis. That component is theory building. The store of society's knowledge is not enhanced through the addition of isolated "truths." Productive research is those efforts that add to coherent and workable theories. Support for this point can be seen in Persell's (1971) study of the quality of research on education. In that study, research quality is defined in part as the contribution a research effort makes to theory building.

Persell's instrument for assessment of research quality does not ask directly about the soundness of the measurement and statistical analysis techniques involved in the study; rather, it concentrates on the contribution made by the work to theory, to methodology, and to educational practice. Persell's work clearly emphasizes that research is more than just measurement and statistical analysis.

Work on the processes of evaluation and development provides the basic information for the second reason for breaking the equation of research with measurement and analysis. In both of these processes, measurement and statistical analysis are necessary tools. If research equals measurement and statistical analysis, then research, evaluation, and development are synonymous processes. Since the function served by research differs from the function served by either evaluation or development, that premise is unacceptable. Research produces generalizable knowledge. Evaluation produces information for a specific decision (Stufflebeam et al., 1971). Development creates validated products and procedures for educational operations (Nadler, 1967).

The fact that measurement and analysis are but one tool in each of these processes becomes clearer when we examine other processes in which the "those are just different forms of research" argument is not commonly proposed. Consider, for example, the processes of teaching and administering. Measurement and statistical analysis are tools in both of those processes, but clearly the processes of teaching and administering
serve different functions than does the process of research.

Measurement is a technique for reducing some entity to a symbolic representation for the purpose of description of the entity. It is done by the assignment of numbers on the basis of set rules. As a technique it is extremely useful in analyzing complex phenomena. Statistical analysis is a technique (more accurately a class of techniques) for simplifying quantities of numbers. Both techniques play roles in a variety of processes, particularly processes that have an empirical base. Yet, clearly, measurement and statistical analysis cannot be assumed to be all of any of those processes, nor can they be assumed to be “owned” by one of those processes.

The Incomplete System

The question, “Has research failed education?” has another facet whose examination helps (a) to further understanding of the research process, (b) to explicate the expectation for that process, and (c) to point up additional processes that must function if the education system is continually to adapt to meet the needs society has for it. The total system seems to have six processes, each of which operates as a subsystem in achieving the education system’s function. Those subsystems are:

1. Educational practice: the teaching and administering processes by which individual learners are assisted to the learnings demanded and paid for by the society
2. Development: the process for creating workable products and procedures for the tasks inherent in educational practice
3. Evaluation: the process for generating information which will help educators choose between selected educational alternatives in specific situations
4. Research: the process for creating knowledge that is applicable across space and time
5. Dissemination: the process of transmitting information between individuals in all aspects of the education system
6. Future projection: the process of identifying alternative educational needs of society which might structure the educational system one, two, or three decades into the future.

These subsystems are interactive in the total system. That is, if one or more of them fails to meet its purpose, severe constraints are imposed on the others. If the research process is not present, the other elements of the system can only operate on knowledge generated via personal experience. If the practice function is removed, the other functions lose their way of interacting with learners and the education system’s ability to satisfy society’s needs is significantly altered. If the future projection process is not operative, the education system finds itself responding to society’s needs after those needs are present. Etc.

In such a system, it is impossible to fault one of the processes for failure of the overall system. The question posed at the outset attempts just that. By asserting that research has failed because it does not have a direct effect on educational practice, an implicit assumption is presented. That assumption is that the education system as a whole is failing to meet relevant societal needs. Nothing stated in this paper argues the accuracy of that assumption. Society’s educational needs are not now being met effectively. The point here, however, is that research failures cannot be faulted as the single cause. The absence or ineffectiveness of several of the other processes is a more valid analysis of the situation.

It must be recognized that the development process, the systematic creation of workable products and practices, is a relatively new process in the education system. Significant efforts of this sort were not initiated until after 1965. Prior to that time most of the work to develop educational products and practices was done by individuals in a mode which would have to be described as profit motive oriented and clinical expertise based, at best. Since that time, development efforts involving systems theory tools and empirical techniques can readily be identified.

It must also be recognized that the future projection process remains to be incor-
porated into the education system. The tools and techniques for this process are only now being developed by the Educational Policy Research Centers at Syracuse and Stanford Universities. The absence of this process hampers the education system in its attempt to meet society's needs. The inability to work toward meeting future educational needs places the education system in an after-the-fact operation. The system waits for society to articulate and certify an educational need; then the educational system tries to create the ways of meeting the need. This type of operational pattern has led to the recognition of a large time lag (approximately 20 years, according to some estimates) between the existence of a broad social need for education and the meeting of that need by even a fraction of the schools that comprise the nation's education system. Such a situation can be accepted when societal change is slow. It creates havoc, though, when significant social and technological changes occur in a single decade, a situation we are now facing.

It must also be recognized that the dissemination process is not by any means systematic. Three factors in that process seem to make the point. First, dissemination of educational information is primarily a visual process relying heavily on the printed page. Little change has occurred here in decades. Second, dissemination seems to have a top-down structure from the fountain of knowledge. The printed media dissemination process gets information from the researcher and gives it to the practitioner. Never does the flow go the other way. As a result, many of the problems in the operation of schools go unattended by researchers and developers. Third, the nation's education system is so decentralized (14,000 plus independent school districts) that dissemination that is to be effective is extremely expensive.

These missing or new process components of the education system are just as much the reason for the failure to meet the educational needs of society as are the failures of research. Education can now be compared to a six-cylinder automobile in which several of the spark plugs are missing. The failure of such an engine to provide transportation should not be placed on one of the spark plugs that is there and functioning.

In summary, Shulman (1970) has stated: "Educational research has been tried and apparently it has failed. Or has it?" This paper has argued that it has not. Research, a process for generating knowledge that is applicable across space and time, cannot be expected to have a direct and immediate impact. Research, a subsystem in the desired education system for meeting society's educational needs, cannot be faulted solely for the overall system's failures. Research, a process involving far more than measurement and analysis, can be improved and thus be held accountable for the creation of coherent and workable theories, an effort that will contribute mightily to the effectiveness of an education system.

For these reasons it is concluded that there have been research failures, but simultaneously research has not failed.

References


