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ABSTRACT

The author advances two primary reasons for the failure of the American educational system with regard to student achievement: a) the lack of clearly specified educational goals and b) the failure of schools of education to teach aspiring teachers how to teach. To remedy the situation the author suggests two different sets of measurable goals, one for the evaluation of students and one for the evaluation of teachers. Student goals should consist primarily of measures of certain skills and concepts. Teachers should be evaluated with regard to a) knowledge of their specific subject area and b) ability to apply principles of behavior and behavior modification in the classroom setting. (HMD)

IMPROVING ELEMENTARY AND SECONDARY EDUCATION

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The proportion of informed laymen who think that public education in the United States is in no need of change is probably very small. Instead, there is a plethora of proposals for the improvement--or abolition--of the traditional public education effort in the nation. The proposals include such diverse approaches as "free schools," "individualized instruction," "performance contracting," and "open classrooms", each hailed by its proponents as the solution to the problems of mass education. As Grayson (1972) has noted ". . . there is the growing demand for change in the present educational system, because of its high and still increasing costs, its low productivity, and its inability to be fully responsive to identified national needs [p. 1216]."

Many, if not all such proposals, however, have been advanced without a clear delineation of the problems which they will presumably solve.

This is not a new state of affairs; the most important problem of education has seldom, if ever, been clearly described. One might assume that the lack of achievement on the part of students would be the most important problem

of education. Such a concern about lack of achievement, however, presupposes, (1) that achievement goals have been specified, (2) that we have valid measures of students' behaviors relative to those goals. A premise here is that any successful attempt to improve education will focus on certain observable behaviors (or products of behaviors) of students and teachers, rather than on such constructs and intervening variables as attitudes, needs, aspirations, self-concepts, etc. This follows from the fact that only observable behaviors and their products can be measured, and that measurement is a prime ingredient in the improvement of education. Measurement is indispensable in determining where we are and to what extent we are meeting specified goals.

There is another reason for the emphasis on observable behaviors and their products. This is the realization that statements about people's attitudes, needs, aspirations, etc. are reducible to statements about peoples' observable behaviors. If, for example, one says that a student "has a bad attitude toward teachers", what is being said is that the student behaves in certain ways. The "bad attitude" is inferred from certain of the student's statements and actions. What we are able to change is the student's behavior; we can also say that we have changed the attitude but such a statement is a superfluous one.

Because indices of the extent to which students are meeting (or failing to meet) prespecified goals are usually absent, we must often fall back on other evidence in order to delineate the problem.

One kind of evidence is the illiteracy rate. In 1968 1% of the noninstitutionalized population fourteen years old and older was illiterate (Statistical Abstract of the United States, 1972). This figure is based only on persons completing less than six years of school. One may question, however, whether this illiteracy figure is a meaningful measure. Student teachers have repeatedly reported to the author their shock at discovering students in their junior and senior high school classes who are able to do little more than write and read their own names. It is noteworthy that in 1969 the U.S. Commissioner of Education chose literacy for all as the educational goal of the 1970's (New York Times, October 11, 1969, p. 39). (Whatever happened to HEW's much publicized "Right-to-read" program? See Welsh, 1972). I strongly suspect that there are many people in this country who are not illiterate in the narrowest sense of the term but who are certainly functionally illiterate, that is, unable to read and write sufficiently well to function adequately in present-day society.

Another source of evidence is the percentage of students who do not finish high school. There are various estimates. According to the U.S. Department of Commerce, in 1971 thirty-four percent of all noninstitutionalized eighteen to twenty-four year olds were not high school graduates (Statistical Abstract of the United States, 1972). Passow (1967) found a dropout rate of from 40 to 50 percent in the Washington, D.C. schools. Forty percent was also the estimate of Lichter, Rapien, Seibert, and Sklansky (1962). Lindgren (1972, p.443) says, "... more than a third of those who start school at age six fail to graduate from high school."

I emphasize the importance of school achievement not necessarily because of a commitment to the belief that education is a desirable end in itself, but rather because of the relationship of school achievement to other factors. Levin, Guthrie, Kleindorfer and Stout (1971) reviewed a number of studies which investigated the relationships between school achievement and earnings, occupational choice, social and economic mobility, political participation and crime. Their review of the relevant studies led Levin, et al. (1971) to conclude that education affects all of the above-mentioned factors. For example, schooling was found to be related to higher earnings, and this relationship was maintained when such variables as age, race, and socioeconomic status were controlled.

Levin, et al. (1971) concluded that:

> Educational attainment and opportunity are linked in many ways. Abundant evidence supports the view that education affects income, occupational choice, social and economic mobility, political participation, social deviance, etc. [p. 14].

The failure of the education system is particularly noteworthy in light of several facts. Teacher's organizations and many educators have often called for reductions in the student-teacher ratio as a means of improving the effectiveness of the nation's educational system, and the ratio has in fact been reduced. In 1965 the ratio was one teacher per 27.6 elementary students; in 1969 it was 1:24.8, (Statistical Abstract of the United States, 1972). For 1979, the figure is projected to be 1:23.6 (U.S. Office of Education, Projections of Educational Statistics to 1979 - 80. Washington, D.C., 1970). At the secondary level that ratio has dropped from 1:20.8 in 1965 to 1:20.0 in 1969 (Statistical Abstract of the United States, 1972) The cost of reducing the ratio is very great and it should be noted that the amount a student learns does not appear to be dependent on the student-teacher ratio (Coleman, 1971; Nystrand & Bertolaet, 1967). Other facts are pertinent. In 1971, eight was the median number of years of experience of all teachers in the nation. Thus, the population of teachers does not consist primarily of novices. Also the amount of formal education teachers have

received has increased. The percentage of teachers holding a bachelor's degree has increased from 64.8% in 1964 to 69.8% in 1971. In 1964, 24.3% of all teachers held a master's degree; in 1971 the figure was 25.7% (Statistical Abstract of the United States, 1972). Public school expenditures have consistently increased in the recent past. In 1959-60 the average expenditure per pupil (in adjusted 1969-70 dollars) was $482. By 1969-70 it was $783 (Grayson, 1972). Another way of looking at this is to point out that school expenditures have risen from 6.4% of the Gross National Product in 1965 to 7.5% in 1971 (Statistical Abstract of United States, 1972).

It now appears that more and more people are convinced that providing money, while a necessary condition, is not a sufficient condition for solving many of society's problems, including those in education. As Grayson (1972) has pointed out:

> . . . very little has been done to relate achievement in learning to the cost incurred. Education is replete with statistics on costs of capital outlays, teachers' salaries, and debt retirement, as well as the cost per pupil in average daily attendance at various levels of education. Every school district has determined the cost to educate a kindergartner, an elementary school student, and a vocational student, but very few know the cost of teaching a course in English, chemistry, or remedial reading. Almost nothing has been done to relate costs to specific achievements in learning, such as the ability to add a column of two-digit numbers, to dissect a frog and point out its major organs, or to comprehend a specified list of words [p. 1218]

Grayson goes on to point out that effectiveness in education does not vary in a linear manner with cost. He maintains, for example, that doubling the number of teachers in a school will, by itself, not double the amount that students learn. It seems clear that although money is necessary for the educational system, what is done with the money is crucial.

Thus, in spite of the "upgrading" of the country's education effort and the increased expenditures that has entailed, one can still ask, "Why do so many students fail to learn so much?"

Some Important Causes

The causes are many and I have no delusions that I will mention all of them in what follows. It does seem to me, however, that the causes (and solutions) I will consider are those that are most important.

Early in this article it was stated that the most important problem of education has seldom, if ever, been clearly delineated. This would seem to result at least partly from the confusion about the basic goal of our educational effort. Is the basic goal to teach students a certain level of mastery of specified academic skills and information? Is it to teach students to "relate" to others? Is it some combination of the two? Or is the basic goal of education something else entirely?

It seems that unwittingly or not, many of those responsible for the training of teachers have redefined the original basic goal of elementary and secondary education out of existence. In place of mastery of the skills and concepts involved in reading,

math, writing and other subject matter areas vague goals have been established. Thus, the goal of education has variously been said to be "development of the whole child," "preparation for life in a democracy," "positive regard of self and others," "openness to new experience" and so on. I would agree with Skinner (1968) that the redefinition of the goal of education has been due to the fact that teachers have not been equipped with teaching techniques powerful enough to enable them to teach all students effectively. I would further agree that almost all of the currently fashionable philosophies of education offer little, if any help in the design and execution of effective teaching practices.

A primary cause of students' lack of achievement is the failure of colleges of education to teach aspiring teachers how to teach. How can we expect teachers to do a better job when they haven't been taught how to do a better job of teaching? There is a study reported by Popham (1971) that should be required reading for every person responsible for teaching future teachers. In this study Popham attempted to assess teachers' proficiency by means of performance tests of teaching skill. Teaching proficiency was determined by the teachers' ability to bring about previously specified behavior changes in students. Three subject areas were involved: social studies, auto mechanics and electronics. In each area the performance of experienced, certified teachers was compared with the performance of persons who did not have any previous teaching experience and who were not trained to be teachers. It was found that in none of the three subject areas did the teachers significantly out-perform the nonteachers. This finding is even more remarkable when one considers

that the teachers had several advantages over the non-teachers. For instance, the teachers were familiar with the school setting, e.g., classroom facilities and resource materials. The teachers had also worked with their students for a number of weeks before the study was begun.[2]

Such a no-difference finding is a result of the ineffectiveness of the teacher training curriculum-- what Popham (1972b) has termed ". . . the historically ineffectual inservice or preservice course [p.11]." It is no doubt true, as Popham (1972b) also points out, that ". . . [T]he characteristic view of education courses is that they're essentially useless . . . [p.12]."

A Remedy

Means by which to improve the situation are available. The first step is to specify the goals of education. Just what is it that teachers should be trying to accomplish? To the extent that we are vague as to what education is supposed to accomplish, to that extent we will be uncertain as to whether or not we have succeeded. As a number of people have pointed out (e.g. Grayson, 1972; Nagel & Richman, 1972; Popham & Baker, 1970) the objectives of teaching must be stated in measurable, behavioral terms. Teachers and aspiring teachers as well as elementary and secondary students should be evaluated in terms of measurable objectives. Present practices are different. Decisions about teachers' effectiveness are usually made on the basis of vague, trivial, irrelevant or unspecified criteria. The results of traditional research investigating teacher effectiveness have not proven helpful. This is probably due to

the emphasis in such research on the identification of teacher "traits" which presumably influence the teacher's effectiveness in the classroom. As Bushnell and Rappaport (1971) point out, the usefulness of such an approach has been minimal because of the vagueness of the terms defining such hypothesized traits.

Two types of specific measurable goals are necessary; one set for the evaluation of students in teacher training programs and another set for the evaluation of elementary and secondary teachers. The first set of goals should consist primarily of measures of certain concepts and skills. Students in teacher training programs should be able to demonstrate a knowledge of concepts in their chosen subject matter areas and in the domain of the principles of behavior. Measures of such knowledge would generally consist of performance on paper-and-pencil tests. Demonstration of certain skills should also be requisite for certification as a teacher. Aspiring teachers should be able to demonstrate that they can effectively apply principles of behavior in changing the behavior of students. The ability to use such principles of behavior as positive reinforcement, shaping, extinction and time-out should be a part of every elementary and secondary teacher's repertoire. Measures of these skills would generally result from observations of the student teachers in classroom settings as well as data reflecting changes in specified student behaviors.

This prescription is made in order that teacher training institutions might avail themselves of effective techniques for bringing about behavior changes. A rapidly growing literature is replete with descriptions of techniques which have been demonstrated

to be successful in changing the behaviors of students in a variety of classroom settings (e.g. Becker, 1971; Hanley, 1970; O'Leary & Drabman, 1971). In addition, there are a number of manuals available for the pre- and in-service training of teachers in the relevant principles of behavior (e.g. Becker Englemann, & Thomas, 1971; Buckley & Walker, 1970; Lamal, 1972; Vernon, 1972).

The measurable goals used to evaluate certified teachers should include such standards as are incorporated in California's teacher evaluation law. The California law provides that each school district must establish its own objective system for the yearly evaluation of probationary teachers and the biennial evaluation of all other teachers. Each evaluation system must include standards and techniques for assessing student progress in each academic area, as well as procedures for determining that teachers are maintaining proper control and a suitable learning environment. As Popham (1972a) has pointed out, the heart of the law is its requirement that teacher competence must at least be partially assessed in terms of students' achievement. The approach codified in the California law no doubt entails problems of implementation. There is no a priori reason to believe, however, that such problems are unsolvable. Certainly the gain is worth an assiduous effort.

A few questions in closing seem germane. One question. is whether colleges of education (or at least those

divisions responsible for training elementary and secondary teachers) are necessary. Do they serve the purpose of producing individuals who are competent to teach? What little empirical evidence is available would seem to call for an answer in the negative. We need more empirical evidence, however. For example, what evidence is there to support the requirement that prospective teachers take such courses as Foundations of Education, History of Education or Philosophy of Education?

Another question is why do we not differentially positively reinforce our better teachers and administrators. Again, there are no doubt problems associated with implementing such a scheme but, also again, there is no reason to believe a priori, that such problems would be unsolvable. And the benefits would seem to warrant an assiduous effort.

NOTES

[1] The author wishes to thank Williams J. Thomas for a critical reading of an earlier draft of this article.

[2] The author is indebted to Judy Thomas for pointing out that the results may have been due to a novelty effect. That is, the performance off the non-teachers' students might have deteriorated as they became "used to" their instructors.

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