

know the conditions that facilitate or hinder their learning. We will expect the function of education to be the achievement of individual freedom (freedom from threat) and not the cultivation of intellectual cleverness. We will expect people to learn their own value judg-

ments and to think independently *because* they have achieved individual freedom. People in the educative process will experience broadly and richly, learning to have faith in their own experience and that of their fellow man.

Education will focus on *people*.

JOHN R. GINTHER

Putting Scholarship To Work Today and in the Future

Two major routes are discernible on the frontiers of advanced study related to education.

FOR THE purposes of this essay, scholarship means advanced study. Thus we are talking about putting advanced study to work, and five areas of problems from the field of education are presented for consideration. The particular subject matter which should be involved is dictated by the various problems, but the characteristics of scholarship remain fairly constant throughout. Advanced study of most of these problems requires that, in various areas of subject matter, we begin to sort hypotheses from tentatively-warranted conclusions and test the former. At the same time, we must continue our exploration of the latter so that we may develop a fuller understanding of the presently warranted generalizations so that they may be made useful in teaching.

Scholarship Related to How We Learn

To what extent do we busy ourselves providing unnecessary kinds of learning

experiences in classes? Is it not possible that students bring to the classroom a rich background of experiences which can be used in teaching and learning? Abramson strongly suggests that we have been overlooking this possibility.¹ His study involved an experimental group which did very little more than discuss pictures projected upon a screen in their darkened classroom. The discussions included personal experiences which were suggested by a given picture. The instructor guided the discussion to insure that the principle of mechanics, embodied in the picture, was related to the discussion. The control group used the facilities of a well-equipped laboratory, which is ordinarily conceived as a place where we provide experiences for children. The experimental group was superior to the control group not only in what they

¹ Bernard Abramson. "A Comparison of Two Methods of Teaching Elementary Mechanics in High School." Unpublished Ph.D. dissertation, New York University, 1950.

learned during the course of the experiment, but also, at a later date, in their recall of what they had learned. Certainly, such studies cannot be ignored.

A second question concerning how we learn is: "To what extent do we develop apathy in students by giving them answers instead of encouraging them to learn through reading or experimentation?" In the manner of fiction writers, some very talented and artistic teachers develop in students a real curiosity or desire to learn about a particular subject, event or phenomenon. These teachers then proceed unimaginatively to tell the student what they want the student to know or learn about the situation. Brandwein, on the other hand, says that we should never tell them anything that is not related to their safety.² He reports that when an experiment in chemistry is performed for the students in his classes, they never find out what ingredients are being used and sometimes never find out what happens at the end of the experiment, unless they ask or perform the experiment themselves. He reports further that in the high school from which more science scholarship winners come than any other high school in the United States, all but one of the science scholarship winners in the past few years have come from classes taught by persons who use the methods he describes. Such procedures again seem relevant to the future of scholarship related to how we learn, and can hardly be ignored.

Another question concerned with how we learn is: "To what extent do we recognize and use problem situations which might motivate learning?" This question really raises an issue which is foremost in the minds of educators today: "Shall

² Paul Brandwein, Forest Hills High School, New York. From remarks made during a science workshop for the teachers of the Fulton County, Georgia, Schools in 1956.

we deal with controversial issues?" A survey completed during the present decade indicates that an overwhelming majority of public school personnel in the United States are either extremely reluctant or refuse altogether to deal with controversial issues in their classrooms. If this is the case, it would seem reasonable to assume that these teachers are ignoring a large number of problem situations which arise in the everyday life of their students, and thus, failing to use such situations to motivate learning in the various content fields. Perhaps we should temporarily dismiss the question as to whether or not one should handle controversial issues in the classroom, attempting to develop, instead, a body of information which would clearly establish whether or not the use of such issues in particular situations is or is not good pedagogy.

Thus, scholarship related to how we learn seems to be faced with the challenge to identify and test certain hypotheses, and to develop a fuller understanding of other tentatively tested generalizations.

Scholarship Related to the Potential Rational Achievement of Humans

In the early 1930's, C. H. Judd challenged American educators with a small volume entitled *Education as Development of the Higher Mental Processes*. So far as one can tell by looking at the curricula and examination systems of American colleges and public schools, Judd has had very little impact on the American educational scene. Perhaps we ought to review his ideas to see whether or not they are of any value in education. One of the ideas about which Judd wrote is involved in the following situation.

One of the three basic concepts in American jurisprudence with regard to

cases involving "civil liberty" is that there must be a logical connection between the fact and the inference involved in the charge. One can hardly fail to see the implications of this concept for education in our country. In a democracy a man is tried by a jury of his peers. Thus, it is imperative that the citizens of this country be able to establish whether or not there is a logical connection between the fact and the inference involved in the charge. There is evidence to indicate that not all people have developed this ability, and there is also evidence to indicate that this ability is not developed automatically by a process of "education."

In support of this last statement are the findings of one division of a graduate school with which the writer is acquainted. Since September 1954, the faculty has been administering a battery of diagnostic tests to all graduate students entering the division. One of the tests in this battery, involving the interpretation of data, contains two different types of items which require two different types of behavior on the part of the student. One section requires the student to determine whether or not certain inferences, purported to be drawn from data presented, are valid. The mean score for entering graduate students on this section is 38 per cent. Since these entering graduate students come from a variety of different colleges, it can be assumed that the behavior involved in recognizing valid inferences drawn from data is not highly developed in students by the schools from which they come. If civil liberty is an important value in our society, and if it is true that the citizenry which sits in judgment of its peers must be equipped to determine a logical connection between the fact and the inference involved in a charge, then we cannot ignore the findings of studies like this.

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Certainly, there is some work being carried forward in this country with regard to the possibility that there are some higher mental processes with which we should be concerned in education. R. W. Tyler, director of the Institute for Advanced Study in the Behavioral Sciences, has been most influential in pressing forward studies of this question. The recent book edited by Bloom and Krathwohl is a serious attempt to provide operational definitions for some of the higher mental processes.³

Bloom, likewise, has posed what is possibly one of the most interesting questions in the field of learning theory. The question, which stems from a consideration of higher mental processes, can be incorporated in the following hypothesis: There is an identifiable point in the learning of an individual beyond which the traditional curve of remembering does not apply, and beyond which learning becomes self-sustaining and self-motivating. This multiple hypothesis obviously rests upon the fuller exploration of the possibility that there are higher mental processes. If and when educators become convinced that there are such, it is to be hoped that some will attempt to make this conviction operationally effective while others will move on to explore the challenging hypothesis with regard to learning which is self-motivating.

Scholarship Related to the Development of Emotional Stability

Attention to human growth and development in this country has been highly

³ Bloom and Krathwohl. *Taxonomy of Educational Objectives*. New York: Longmans, Green and Company, 1956.

successful in getting teachers concerned with the problems which growing children have. There is some evidence to indicate that this has resulted in changed and, perhaps, improved attitudes toward students on the part of teachers. There is also some indication that teachers who thus develop such altered attitudes toward children, are likely to take into account the special problem which a particular child may be having in learning. On the other hand, one hears many public school teachers complain that they are being provided with information about students which is of no value to them, because "there is nothing they can do about such situations." Obviously, some of the people involved in such discussions are rationalizing. However, is it not possible that many of the teachers who respond in this way are sincere in what they say? Are we really providing teachers with techniques for discovering "maladjusted" children without providing these teachers with an understanding of what they as teachers can do directly and when they should refer such children to other sources of help?

It would appear that this situation results from a confusion of ends and means. A very simple objective might be for teachers to develop more desirable attitudes toward children. A further objective might be for such teachers to take account of some of the differences between children which might arise from causes which the teachers have studied. However, consciously or unconsciously, these relatively simple objectives are becoming enmeshed and confused with some large, vague notion that teachers should be able to resolve the problems and emotional difficulties of their students. When this happens, we begin to tread on unsound ground theoretically, professionally, and probably legally.

The cases which are brought to a successful conclusion by such professionally trained personnel as counselors, clinical psychologists, and psychiatrists are still so few as to be a source of intense interest and curiosity on the part of teachers and the general public of this country. It would appear that we need much more research involving both longitudinal and comparative studies before we can determine the effectiveness of even professionally trained personnel in handling the emotional problems of students in schools. Once we are in possession of information indicating the per cent of cases which carry the prognosis "guarded," even after professional handling, we will be in a much better position to suggest to teachers how they ought to handle cases involving emotional disturbance.

For the time being, it seems reasonable to say that we should be more careful about generating in teachers the idea that they should personally be responsible for the resolution of a majority of the problems involving emotional disturbance among their students. Perhaps, for the time being, we ought to stress the possibility that the present systems of record-keeping and evaluation, especially those involving extensive anecdotal records, may point to the responsibility which the teacher has for making appropriate referrals of students in the classroom.

Associated with the area of emotional stability, and arising from the writings and speeches of those who have brought the area to the foreground, is a concept known as "the uniqueness of the individual." Recently, one of the proponents of this concept presided over a conference which was aimed at developing an understanding of this concept. Throughout the conference period, the principal consultant constantly drew examples from

normative studies of behavior. To some this seems, if not a bold contradiction, at least a major inconsistency. If proponents of the different points of view are having such difficulties, perhaps we need to re-examine the "normative" versus the "unique" positions with respect to child development before we can move forward either in the theory or the practices which will make this of value in education. Certainly there are some major hypotheses which need yet to be tested in this general area.

Scholarship Related to the Fuller Exploration of Subject Matter

Perhaps one of the areas of greatest misunderstanding in the field of education for teachers is that of the nature of "problems." Some pragmatists say that there are both existential and conceptual operations involved in thinking, and that these have their counterpart in kinds of problems. Such a statement is reminiscent of the terms "theoretical" and "practical" which are familiar in the history of philosophy. The point which the pragmatists are trying to make is that in the education of students in the United States we tend to deal exclusively with one or the other kind of problem. Their argument is that failure to take into account both kinds of problems leads to an education which is lopsided because it does not challenge the full potential of the human mind.

Let us take the field of mathematics as an example. Traditionally, arithmetic has dealt with problems of a practical nature, or with operations which would allow one to deal with problems of a practical nature. During the past decade and a half there has been a strong move to orient high school courses in algebra, geometry, and trigonometry in this same, practical direction. This movement has not really

been from conceptual to existential or from theoretical to practical, but has, rather, been aimed at developing a fuller understanding of the existential or practical orientation of mathematics. What the philosophers are talking about is demonstrated by Dantzig.⁴ He shows how the conceptual aspects of mathematics, dealing with the theory of numbers, can be developed in all courses of mathematics at all levels of instruction.

This idea is relevant to some of the present-day experiments in the education of "gifted" children. Almost without exception, when a special curriculum in mathematics is devised for such students, it consists of a speeding up of the traditional program in mathematics. This usually means that when the students have finished the regular high school curriculum in mathematics, they are led into the usual college curriculum in mathematics. If one were to follow the ideas of Dantzig in these present situations, the curriculum for these particular children would involve them in the development of an understanding of the theory of number. Actually, of course, these ideas should be incorporated in the present curriculum for all students beginning in the very early grades. Perhaps our present lack of "pure mathematicians" is largely a result of the fact that students of mathematics who have been denied this conceptual aspect of the field of study have no sense of direction in the field after they have finished the traditional curriculum.

Insofar as the above outline of conceptual and existential, or theoretical and practical in the field of mathematics is a reasonably accurate one, it provides a model for other fields of study. At least

⁴ Tobias Dantzig. *Number, the Language of Science*. New York: The Macmillan Company, 1930.

this single example allows one to set up the hypothesis that there are existential and conceptual fields of operation in various content areas. This hypothesis has yet to be confirmed or rejected in some fields of study. It is directly related to an earlier section of this paper in which it is suggested that problems might well become the focus of attention in learning situations. If various subject matter fields are able to establish clearly the possibility that there are both theoretical and practical operations in their field, then a problem situation should be explored in both directions if we are to provide a full, rounded education for our students. It also means, and this is where great misunderstanding has developed in the past, that problems which are the center of attention can be of either kind.

Another major concern with regard to subject matter is whether or not it can be organized in some fashion other than the usual "logical" arrangement. It would seem desirable for us to undertake some longitudinal studies of the effectiveness of education which is organized around major concepts such as "entropy," or "conservation," or such generalizations as "democracy is evolving as a social as well as a political term." Literature about public education is filled with statements to the effect that when education begins to be organized around such concepts or generalizations, we will develop some real sequence in learning and make it more effective. We will begin to develop a firmer basis for accepting or rejecting this hypothesis if the literature of the next ten years begins to report experiments designed to test it.

Scholarship Related to the Diagnosis of the Present Status of the Learner

The earlier sections of this paper are all related to the present section. When

we know more about how the learner learns, the potential of the learner, the effect and status of the emotional stability of the learner, and what it is we want the learner to learn, we will be in a much better position to determine what we should look for in diagnosing the present status of the learner. In addition to these, it is becoming more and more apparent that we have a great responsibility for looking at the physical condition of the learner. Of course, we have extensive records of the height, weight, and periods of illness of children. In addition, most schools now provide tests of both hearing and vision, and first-aid services in the school clinic. The following example, however, may provoke some question as to whether or not we are really taking into account the physical condition of learners. Perhaps it should be stated that this is merely the most recent case discovered by the writer. The teacher and the school psychologist happened to be discussing this case when the writer entered the room. The following is a portion of the report from the school psychologist, dated September 28, 1956:

Charles was referred by his teacher, Mrs. X., who felt that the child was retarded. He was repeating the first grade and showed no indications of learning to read. This is the second of four children who have been placed in a foster home by the Social Welfare Department. It is said that the mother is an alcoholic and that the father is, or has recently been, in jail. Last year, the boy's teacher recommended that he be given a free lunch because he seemed undernourished. That teacher also reported that he was "unable to do formal work."

The following is a portion of the report from the physician who examined the child. This report is dated October 26, 1956.

External examination revealed visual acuity readings impossible to ascertain at this visit. The remainder of the external examination

was fairly well within normal limits. Although I could not definitely establish that stereopsis was present, I do believe that the boy is experiencing single binocular vision.

Refraction under cycloplegia turned out to be one of the most amazing and surprising that I have ever witnessed in the eight years that I have been actively connected with ophthalmology. The lad is so highly farsighted that one can make the unequivocal statement that the world has been nothing more than a blur to him. His vision could easily be compared to that of the elderly individual who has undergone cataract surgery and then lost his spectacle lenses. Of course, a glass has been ordered for the lad which I think should make a world of difference in this boy's progress, for I feel that for the first time, he will see faces, figures and objects which he has never witnessed before.

One wonders how many extreme cases like this are wandering around the halls of our public schools, and how many hundredfold other, less severe cases, need immediate attention. In addition to becoming more effective in our handling of "obvious" cases, such as the above, it appears that we ought to begin to explore more fully the possibility that many of the children sitting in our classrooms today have brain damage, circulatory defects, respiratory defects, or other physical imperfections or damages which might be limiting their learning.

It seems likely that the field of education would profit immensely from a closer

alliance with the fields of physical science. These fields hold the potential for establishing criteria related to how we learn, when we learn, and what learning is. It seems unfortunate that the work of Simon and Binet in improving upon the diagnoses of children's ability to profit from education, which were then being made by physicians, should have developed such a wide chasm between those people interested in educating children and those who are physical scientists. Some bridges have been established across this chasm, but what this writer thinks we need is a glacier which will destroy all but faint traces of the chasm which was created earlier.

In summary, then, it appears that there are at least two major routes discernible on the frontiers of scholarship related to education. One of these entails the development of a closer alliance with fields such as chemistry, physiology, psychology, medicine, and philosophy. The other is the sorting of hypotheses from tentatively warranted conclusions. These hypotheses must then be subjected to rigorous testing. If we have any extra energies, they can well be devoted to the development of a fuller understanding of the tentatively warranted conclusions. It is to be hoped that such procedures would lead to improved education for our children.

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