

THE TEACHER

TODAY if you are in education and can talk knowingly of *inquiry* you are definitely *in*. Both professionals and lay persons find it fashionable to be concerned with inquiry—and this is a proper fashion. Thoughtful educationists have always been concerned with learning that goes beyond the mere taking in and storing away of someone else's knowing. They have always searched for ways to help learners experience and build upon native curiosity, the drive to find out, to understand, and to know at firsthand.

Professionally and consciously or instinctively, sensitive teachers have always tried to arrange instructional conditions so that pupils would become *seekers* after meanings, *users* of information, *discoverers* of general principles, *validators* of first conclusions, and *builders* of values as well as memorizers of facts, concepts, and more general ideas. In short, good teachers have always tried to help their pupils to become *students*.

It is stylish now to think about attempts to achieve such second order learning as promoting inquiry, yet other words in other times have also been used to denote very similar processes. Other

expressions include the Socratic method, Dewey's problem solving, Corey's action research (Corey, 1953), Foshay's making knowledge (Foshay, 1961), the discovery methods of Bruner (1960), Hendrix (1961) and others, and inquiry strategies by Thelen (1960), Suchman (1963) and Taba (1962).

A Way of Living

Perhaps the most systematic overall formulation of inquiry as a process in its current context is that of Thelen in his unusually thoughtful *Education and the Human Quest*. Here Professor Thelen proposes inquiring not only as a utilitarian process for finding out or knowing but, more excitingly, inquiring as a way of human living. Says Thelen (1960, p. 218):

The job of education as the maintainer of society and the developer of individuals is to discover values and experiences that need to be assimilated from all parts of community life, and to seek, create, and intervene in the processes of interdependence among all the people in the community. The process of discovery is not something apart from the processes of intervention. Education is an aspect of life, and in the largest sense, every man with a purpose is to some extent both a teacher and a student.

AND INQUIRY

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For the classroom teacher trying to perform the highly complex act of teaching as a professional rather than as a mere technician, or worse as a rank amateur, the interest in inquiry is more than academic. The classroom teacher assuming the stance of the professional will be able to talk the lingo and trace the history of the movement, yes, but more importantly, will inquire into the nature of his own teaching and will work in ways which foster pupil inquiry.

It may be said that a professional in any field may be described as one who makes considered rather than hand-me-down decisions. Professional decisions are those decisions which are (a) made self-consciously after diagnosis based upon theory and (b) made with a prediction of consequences based upon organized knowledge, theory and informed opinion.

What specifically does a teacher do about inquiry in the classroom that would distinguish him as a professional teacher? At the prime and perhaps also the most profound level, inquiry is the exercising of curiosity. The more significant the inquiry, the more systematic and penetrating the application of curiosity. The teacher who would *knowingly*

foster this in pupils would provide, of course, opportunity and encouragement.

So simple to say! Yet what are the necessary conditions of opportunity and encouragement? Most critical to opportunity is time, and providing time is exceedingly difficult. For time is also needed to master important knowledge already too vast for mastery and increasing at a geometric rate. Time for the pursuit of casual curiosity at school is usually seen as prohibitive; and to expect to find the extended amount of time necessary for systematic inquiry may indeed be visionary, but we hope not.

Important too is time for the careful teacher-planning so necessary to significant pupil effort. Providing opportunity for inquiry, besides involving time, requires the existence of a rich and stimulating environment—both physical and psychological. Providing a rich physical environment entails enriching the classroom and school with objects and printed materials. Especially in science and social studies, the physical environment can also be enriched by extending the classroom experience to include a wide variety of field trips and excursions.

Providing psychological opportunity

for and encouraging the stimulation of pupil curiosity constitute overlapping teaching functions and this brings us to the central concern of this paper. Obviously the psychological environment can be enriched by bringing to the classroom interesting "outside people" and by taking or sending students from the classroom to consultants, resource people, and to important human events.

Pupil-Teacher Planning

Working directly with pupils, in a general way, the teacher promotes the process of inquiry when there is genuine pupil-teacher planning. When pupils help to set meaningful goals, help to formulate the procedures necessary for achievement of the goals, help to develop and apply criteria for assessment of the progress, and reformulate action plans—then, indeed, inquiry is in process.

Specifically, psychological opportunity and encouragement for pupil inquiry is determined by the teacher in the classroom moment by moment as the pupil-teacher interactive process unfolds. When the teacher begins to talk, the focus for classroom attention is set and so is student opportunity. There may or may not be inquiry, depending upon the way the teaching-learning situation is structured by the teacher.

The questions the teacher asks or the assignments the teacher makes determine the quality of thinking required of pupils. If the assignment or question to the pupils (structuring, focus) is sufficiently open to permit some significant pupil choice in making a response, then drawing inferences rather than mere remembering will be the most likely consequence. If the assignment or question is closed or narrow in its scope then re-

call will be required, but such inquiry-type mental processes as *comparing*, *hypothesizing*, *evaluating*, or *generalizing* will not.

What is the chance for pupil inquiry in classrooms where such closed questions or assignments as the following constitute the usual state of affairs? ¹

Teacher to a ninth-grade class in general science:

State the basic chemical compounds which are necessary for photosynthesis.

Teacher to a senior high school class in American history:

Without referring to your books or notes, tell which major events in American history led to the adoption of the Constitution.

Teacher to a fifth-grade class:

What punctuation is used to mark the end of a declarative sentence?

Teacher to a second-grade class (actual classroom question from February 1965):

What is a pronoun?

It is clear that the preceding questions and assignments and others like them do not require pupil inquiry for making the expected response. That the learning of facts, definitions, concepts and general ideas is absolutely necessary for pupil growth cannot be denied, but that this should be the near single concern of the school is surely open to doubt. Discriminating, recognizing, and remembering must always be basic mental activities for learners, but these are not the only mental abilities that should be exercised. Studies of actual classroom teaching in-

¹ Many of the examples here are from a report of a faculty study project *Frontiers of Thinking* (Faculty, 1964).

dicate that pupils receive a disproportionate amount of such memory testing questions and assignments (Hughes, 1959; Miller, 1958; Flanders, 1960; Bellack, 1963).

Of course it is possible as well as desirable for teachers to ask more open-ended questions and to make assignments which trigger pupil use of a wide variety of such mental abilities as comparing and contrasting, exploring, hypothesizing, evaluating, generalizing, creating. Examples of such classroom structuring follow.²

Teacher to ninth grade in general science:

Propose an original experiment useful in demonstrating an understanding of photosynthesis.

—Or in the same situation:

How could the men of science provide enough food for the world's population if atomic explosions were to interfere with plants' ability to photosynthesize?

Teacher to a senior high school class in American history:

Which of these constitutions would you prefer to live by? Give your reasons.

—Or in the same situation:

Suppose you were one of the colonizers transported to a distant planet; write a constitution for the colony to live by that would help man to become his most human self.

Teacher to a fifth-grade class:

In what ways might we change these sentences to make them more interesting?

Teacher to a senior English class:

In what ways could we improve the English methods of communication?

² *Ibid.*

Apparently pupil inquiry in classrooms is additionally enhanced if, instead of imposing new structure, the teacher develops the focus of concern through clarification of pupil comments thus leaving to them much of the initiative. Further enhancement is apparently also achieved through suggesting new options and through expressing encouragement.

Do pupils react differently when teaching is more open-ended? If there is greater opportunity for inquiry and participation, are there differences in pupil mental activity and in attitude? Limited evidence suggests that there are.

Open-endedness in Teaching

One study found open-endedness in teaching to be related to higher levels of pupil thinking. The general design for the study involved teaching 100 seventh- and eighth-grade pupils staged lessons about American economics. The pupil population was randomly divided into two main treatment groups and eight instructional groups, each of which studied the same ten thirty-minute lessons. Half of the groups of pupils were instructed under teaching which was more directive, and half were instructed under teaching which was more responsive or open-ended.

Each of four teachers taught one group of pupils in a highly directive manner and one group in a more responsive manner. The levels of understanding exhibited by pupils during discussions of the lessons under each treatment differed at a very high level of statistical significance. Teaching which was high in directiveness was accompanied by pupil comments made during discussions which were restricted almost en-

tirely to *recognition* and *recall*; teaching which was more open-ended was accompanied by pupil comments made during discussion which over-all, were at *higher levels of understanding*. Such mental activities as making comparisons, drawing inferences, making judgments, evaluating, proposing hypotheses, and drawing conclusions were in evidence more frequently than were simply recognition and recall under open-ended teaching. Pupils under more responsive teaching also expressed a significantly greater number of more positive attitudes toward the study in pencil-and-paper opinionnaires than did pupils under the more directive teaching (Miller, 1964).

Can teachers change their teaching to be more open-ended? There is evidence that they can. Flanders (1963) worked with some fifty-one teachers-in-service to determine the usefulness of a nine-week in-service training program, in which the teachers "learned to assess their own problems of verbal influence, to experiment with different patterns, and to try to establish principles of influence from their own experimentation." The effort was remarkably successful.

In an attempt to inquire into the nature and consequences of their own teaching, a few teachers of the present author's acquaintance have attempted to increase the open-endedness of their own instruction through use of action research. These teachers recorded on audio tape thirty-minute samples from their own classroom pupil-teacher interaction and made typescripts from the audio tapes. Analyzing the quality of their questions and assignments and the consequent pupil response, these teachers tried to increase the open-endedness

of their questions and assignments and to increase the proportion of teacher comments which served to clarify pupil contributions.

Results were dramatic, but not without some frustration and discouragement in the initial stages. (Changing one's way of teaching is not an easy undertaking.) During a four-month study period one teacher more than doubled the proportion of clarifying comments characteristic of his teaching while also decreasing the amount of closed-type questions and assignments by nearly 30 percent. He increased the open-type by a similar margin (Holt, 1963). Other examples are as impressive but have not been written up in a formal manner.

To summarize, it may be said that inquiry as a valued school activity, although not exactly new, is in—and it should be. Strategies for providing opportunity for inquiry are many and extend from ancient times down to the immediate present. Any teacher who wishes to provide greater opportunity for pupil inquiry can begin by trying to make his questions and assignments a bit more open-ended and by exerting a greater effort to respond to and clarify pupil contributions. Those who would be even more ambitious can study some of the excellent strategies now in print.

References

- A. Bellack and J. Davitz. *The Language of the Classroom*. New York: Institute for Psychological Research. Teachers College, Columbia University, 1963.
- J. Bruner. *The Process of Education*. Cambridge: The Harvard University Press, 1961.
- . *On Knowing: Essays for the Left Hand*. Cambridge: The Harvard University Press, 1963.
- S. M. Corey. *Action Research to Improve*

School Practices. New York: Bureau of Publications, Teachers College, Columbia University, 1953.

Faculty, William M. Stewart School. *Frontiers of Thinking*. Salt Lake City: William M. Stewart School, University of Utah, 1964.

N. A. Flanders. "Helping Teachers Change Their Behavior." East Lansing: School of Education, Michigan University, 1963. (Mimographed.)

———. *Teacher Influence, Pupil Attitudes, and Achievement*. Minneapolis: University of Minnesota. U.S. Office of Education, Cooperative Research Project No. 397, 1960. (Available as Cooperative Research Monograph No. 12, OE-25040, Washington, D.C.: Supt. of Documents, U.S. Government Printing Office.)

A. W. Foshay. "A Modest Proposal." *Educational Leadership* 18:8; May 1961.

G. Hendrix. "Learning by Discovery." *The Mathematics Teacher* 54: 5; 290-99; May 1961.

L. Holt. "Study of Change in the Behavior of One Teacher." Salt Lake City: Unpublished Masters Thesis. University of Utah.

M. Hughes. *Development of the Means for the Assessment of the Quality of Teaching in Elementary Schools*. Salt Lake City: University of Utah Press, 1959.

G. L. Miller and Staff. *Progress Report of the Merit Study of the Provo Schools*. Provo, Utah: The Board of Education, 1958.

G. L. Miller. *An Investigation of Teaching Behavior and Pupil Thinking*. Salt Lake City: Utah State Board of Education Research and Experimentation Funds Section, Agreement Number 4622, 1964.

A. Shumsky. *The Action Research Way of Learning*. New York: Bureau of Publications, Teachers College, Columbia University, 1958.

J. Richard Suchman. *The Elementary School Training Program in Scientific Inquiry*. Urbana: University of Illinois Press, 1963.

H. Taba. *Curriculum Development: Theory and Practice*. New York: Harcourt, Brace & World, Inc., 1962.

H. Thelen. *Education and The Human Quest*. New York: Harper & Row, 1960.

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