DOCUMENT RESUME

ED 029 759 RE 001 765

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Pub Date 23 Apr 68

Note-13p.: Paper presented at International Reading Association Preconvention Institute, Boston, Mass., April 23, 1968

EDRS Price MF-$0.25 HC-$0.75

Descriptors-*Behavior Change, *Communication (Thought Transfer), *Critical Reading, *Educational Environment, Environmental Influences, Grade 5, Learning Experience, *Learning Processes, Reading Comprehension, Verbal Learning

The relationship between a person's behavior and the interaction with his immediate environment is discussed as a shaping process. The behavior that is shaped is always that which is directly and crucially involved in the choice he makes, the response he makes, and the way that response affects him in the given situation. The abstraction process involved in bringing subject matter to the classroom too often renders it in such sterile verbal form that it becomes meaningless to the learner who lacks a background of perceptual experience with the concepts. Two conditions often found in classrooms inhibit behavioral change. (1) Verbal communication without comprehension is substituted for perception and conceptual understandings. (2) The student is required to listen or read but is not enabled to make adjustive responses. Four conditions for behavioral change in the educational setting are discussed: (1) the quality and availability of the learning tasks, (2) activation of all phases of the learning cycle and levels of thought, (3) devices used to influence student behavior, and (4) verbal-conceptual ratios and balance. The beginning stages of a project in critical reading in which a task analysis was written for use with fifth graders' analyses of newspaper articles is reported. (CM)

HUMAN BEHAVIOR AND THE ACQUISITION OF COMPETENCE IN CRITICAL READING

IRA Preconvention Institute

Boston, Massachusetts
April 23, 1968

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I. HUMAN BEHAVIOR AND ITS CHANGE PROCESSES

The variations that mark public discussion of human behavior and learning are so enormous as to be almost incredible. The divergent views are so great that many have been led to take a nihilistic position and toss off all claims as equally dubious and optional. This is probably so for two reasons: everyone tends to regard himself as a competent observer of human behavior and to offer his own version of it with some confidence; and among psychologists we still suffer from the apparent divergencies that arise from intensive preoccupation of a person with one facet of behavior and from overgeneralization of what he finds in that facet. Relatively few psychologists are making a serious effort to compose an adequately comprehensive description of human behavior for educational purposes, but the materials for such a description are available, and a sound and demonstrable picture is steadily coming into view.

Until that picture is familiar to educators, and until we begin to plan our educational programs squarely on its full structure, we will continue to fail to have a serious impact on the out-of-school behavior of students. I will begin with an attempt to sketch some of the emerging aspects of that picture. Then I will suggest what that picture implies for our educational enterprise. Finally I will describe briefly my first venture into the field of critical reading from that background.

It is enormously helpful to look at human behavior as a man-environment interaction. That is, the person lives within an immediate environment from which he must acquire all that he needs to sustain him, and his behavior consists of a coping interaction with that environment. There are two cybernetic loops operating in that relationship, and they are interdependent. The term "cybernetic" means simply in this case that we have an organism which consists of an energy system, and that its behavioral processes are self-correcting as a result of the consequences of its behavior.

One of those two loops is within the person's central nervous system, and the other is between the person and his external environment. The first consists of perceptual input, internal storage of the input and its organization into a variety of mediating variables, a process by which those mediating variables bridge over into an overt response or energy output in the form of some operation on the environment, and the perception of the consequences of that response. The mediating variables, once they have begun to accumulate, operate as the antecedent psychological conditions with which a person faces each oncoming situation, and the determiners of his response to that situation. During the response, and as a particular result of the consequences of that response, those antecedent psychological conditions are likely to be changed, and this is what constitutes learning or behavioral change.

The other loop, between the person and his environment, also involves change as a result of response. Overt behavior is an operation on the environment in some way. That usually changes the environment. The environment is changing as a result of the behavior of other persons too, and as a result of other non-personal forces and events. Therefore a person changes as he behaves, and his environment changes as he behaves. Thus he faces continually altering stimuli as he interacts with his surroundings.

Behavior is self-correcting (that is, it is shaped) through the reinforcing or deinforcing impact of its consequences. It shapes toward satisfying responses to environment and away from annoying responses. The person tries to promote the development of satisfying external conditions, and the elimination of annoying conditions.

Shaping occurs only when the feedback loop is operating. That is, it changes in situations:

1. When the person is interacting with real referents (not verbal substitutes for them.

2. Where the situation requires an adjustive response from him. (That is, his own dynamic needs are being directly affected in a way that matters to him.)

3. Where the person has to choose a response and carry it out himself.

4. Where the person has to suffer (or enjoy) the consequences of his response.

Furthermore, the behavior that is shaped is always that which is directly and crucially involved in the choice he makes, the response he makes, and the way that response affects him in that situation. To put the matter in educational terms, what students generally learn in school is how to beat the school system, rather than to behave according to the ideas contained in the subjects they study. This is so because the ideas they talk about are rarely if ever involved in any immediate adjustive acts or consequences to them, but their status with the teacher and with their friends and parents as a direct result of how they get along in school is always involved and affected by their competence in beating the school system.

What has been said so far reveals a very tight and intimate relationship between the person's behavior and the stuff that makes up his immediate

environment. Obviously the subject matter of this kind of learning is that immediate environment. What is its composition? It is made up of all the many objects (floors, persons, dogs, food, molecules, stomachs) that exist in nature, and of all of the events in which those objects engage (holding people up, interacting, barking, entering the mouth to be eaten, vibrating within larger structures, digesting food), and all of the consequences produced by those events, and the perceived impact of those consequences on the self, and the ensuing sense of satisfyingness or annoyingness that follows those impacts.

This is the subject matter we must bring into the schools. The so-called subject matter we now have there in such sterile verbal form was actually abstracted from this real and active environment. The abstraction process has rendered it sterile and meaningless to the struggling learner because he lacks a background of perceptual experience with it. Knowledge in that abstracted form cannot be transmitted from one person to another. Each person must manufacture his own, by the same perceptual process the original knowledge-finder used.

The loop that changes behavior is broken (and shaping is stopped) when:

1. Verbal communication without comprehension is substituted for perception and conceptual understanding (don't confuse the power to recall verbal information with an understanding of it), and

2. The full response cycle is prohibited, and the student is required to listen or read, but is not enabled to make adjustive responses and suffer their consequences in real situations involving the ideas being heard or read.

These two crippling conditions are usually present in the typical classroom, excluding activity programs such as the science laboratory and the woodwork shop. I realize I am making a very disturbing statement, but the facts of human behavior stand squarely behind it. All of our subjects will have to

be put back into the form of environmental objects and events with their consequences, and learners will have to get involved in regular man-environment interactions with them before education will have any serious impact on human living.

I said earlier that we have not yet faced up adequately to the full range of human behavior. It has been too easy to divide into the camps of the operant conditioners, the verbal learning advocates, and the concept formation people. Human behavior varies along a continuum of complexity from a simple conditioned signal response at one end, to deductive inference and creative invention and expression at the other end; from animal-like confinement to the immediate present, to the most extended kind of idealistic planning for a distant future. The complexity is greatest when the person is aware that:

1. The central goal is very complex rather than simple.

2. Several other goals or values will be affected in the pursuit of a central goal.

3. Several possible means or paths to that goal exist and require a choice.

4. Extensive time is required to reach a goal, and circumstances change along the way.

5. Many elements or forces impinge on the person as he pursues the end and affect the outcome in complex ways.

In these two figures it may be possible to see some of this range.

(Types of Human Behavior from the Reflex Level to Deduction)

Fig. 2, "First Steps . . . "

(Mediating Variables and Related Overt Behaviors)

Fig. 8:1, manuscript

There is something of every part of this range in most of the behaviors we are concerned about in education. Until we submit each subject to this kind of analysis and find out what its psychological requirements are, we need not expect much impact on student behavior.

For educational purposes it is useful to sort all of these behavioral possibilities into a set of types that recur constantly in life. Three are easily identifiable.

Type 1 - Identifying, Discriminating, and Matching (Covert Behaviors)
- Perception of referents in the environment.
- Thinking about what has been perceived in both the present and the past and organizing it conceptually.
- Identifying and differentiating referents and their various properties and uses.
- Comparing and matching referents and their properties and uses.
- Identifying (choosing) a goal (a condition or product to seek, produce, or accept).
- Choosing materials (or elements of any kind) required for producing the goal.

Type 2 - Performing Adjustive (Instrumental) Acts upon the Environment (Overt Non-verbal Behaviors)
- Making and executing decisions.
- Locating and securing materials required for reaching a goal.
- Preparing the materials for processing into the goal or product.
- Processing the materials into the goal or product.
- Performing motor acts in any of the foregoing behaviors.
- Following customary patterns and arrangements in any of the foregoing behaviors.

Type 3 - Verbal Communication (Overt Linguistic Behaviors)
- Verbally identifying referents and discriminating among them.
- Speaking or writing discursive sentences to express one's thoughts and judgments.
- Repeating memorized information.
- Using taxonomic and topical symbolic hierarchies to represent bodies of information.

When we learn how to activate these behaviors in school we will begin to affect out-of-school behavior, for transfer will be absolute and immediate. The behavioral objective move is attempting to accomplish this.

II. IMPLICATIONS FOR THE EDUCATIONAL ENTERPRISE

If the classroom can be thought of as a learning theater, then a stage change is needed. The traditional concept "To Teach" consists of dispensing verbal information from an active teacher to a group of quiet listening children. This model of teaching cannot be made productive by merely modifying it, as we have been trying unsuccessfully to do for a century. A diametric change is required. We will have to abandon the "To Teach" model and get the teacher off the stage. What we need is a "To Learn" model, with the student on the stage and the teacher (no longer a teacher but a stage-setter and guide) in the wings. The learning theater will require a few essential conditions of the kind that make behavioral change possible, and it will be the responsibility of the erstwhile teacher to produce and maintain those conditions, and then to let learners learn. Those conditions, in brief, must set up and maintain a continuing man-environment interaction for students, with all of the elements present which are so effective in producing behavioral change outside of school. Here is a condensed description of five conditions which have this power.

The most essential condition for behavioral change is in the nature of the QUALITY AND AVAILABILITY OF THE LEARNING TASKS. Behavioral objectives and behavioral units aim learning directly at behavior. Without them we tend to traffic in various kinds of verbal information or aimless activity which have little power to affect daily behavior. It will be years before we have an adequate repertoire, ready in advance, of behavioral units for all parts of the curriculum; but until we do there can be little individuation of learning, little real self-responsibility for learning by students, and little freedom for teachers to become planners, stage, setters, and consultants to self-directing learners. Whenever one or more behavioral units can be supplied, these productive conditions can follow.

Granted students can be put to work on actual behavioral tasks, the next most essential condition is the continuous activation of all PHASES OF THE LEARNING CYCLE AND LEVELS OF THOUGHT. Human behavior is heavily dominated by conceptual patterns which provide an individual with the power to cope with his environment. Both the concepts themselves and their transformation into actual motives and behavioral competencies require all five phases of the cycle described earlier. Furthermore, the concept-forming phase must advance beyond mere repetition of observed information. It must involve description of what is observed, moving on to analysis, organization into meaningful concepts, interpretations and explanations, and finally the forming of conclusions, the making of predictions, and creative and inventive reconstruction of ideas. This cycle is behavior in its complete form. Any attempt to reduce it to mere verbal rehearsal of "what one might do," or merely to discuss such behavior academically, destroys the essence of reality and makes behavioral change impossible. Obviously this behavioral cycle requires reality in the learning materials. Otherwise real perception, real decision making (either personal or vicarious), real or vicarious trial, and real or vicarious feedback do not exist. When they do exist, behavior can be affected.

With behavioral tasks, and with the full cycle of behavior operating, the next most critical condition consists of the DEVICES USED TO INFLUENCE STUDENT BEHAVIOR. Influences that elicit student perception, recall, review, conclusions, and predictions, are indirect and highly educative. They make the learner the active party, and make him a self-directing inquirer. Influences that describe, give data, state conclusions, state predictions, and state moral precepts without allowing students to recognize them from their natural premises are direct and inhibitive of student thinking. These influences emanate from the teacher, making him the most active person and subordinating

the student's behavior to that of the teacher. Influences that prescribe or regulate, disapprove or criticize unconstructively, physically manage, command, threaten, or use aggressive force, are control devices that have no educational value. They arouse either resentment and rebellion or submission and withdrawal from responsibility. Behavioral change requires the indirect influences, with their power to activate the full cycle of learning.

Closely related to the cycle of learning and the use of indirect influences, is the use of verbal communication in the classroom, and particularly the VERBAL-CONCEPTUAL RATIOS AND BALANCE in that communication. In short, behavior can be changed most effectively when students do more and more of the talking, when they are talking about what they know conceptually, and when any verbal information they obtain is intimately related to the concepts they are acquiring and is necessary to the thoughtful use of those concepts in making decisions. Under the opposite conditions, verbal activity can destroy thinking, interfere with conceptual activity, degenerate to laborious memorization of information, and swing back to a teacher-dominated ratio with passive and bored students.

When the first four conditions exist, it becomes meaningful to talk about WORKING CLIMATE AND TEACHER-PUPIL COMMITMENT TO TASKS. Working climate is largely, but not exclusively, a social problem. It rests heavily on good personal relations, on contagious vitality in the teacher, on diagnostic and remedial attention to each student, and on the continual reinforcement by the teacher of productive behavior by the students. The climate factor is largely a stimulation and trouble-shooting factor, whereas the other four factors are basic parts of the behavioral change processes.

III. A PROJECT IN CRITICAL READING

At Dr. Reid's invitation I recently undertook a project in critical reading, to attempt the application of these ideas to the reading task. The focus is on discriminative reading of materials dealing with controversial matters, an area in modern life of critical importance at all levels of life. The objective is to help students learn how to read for precise and accurate meanings, through giving them certain conceptual tools in reading which lead to the orderly processing and organizing of the information contained in the reading material. It is anticipated this will give the students increased ability to understand a statement, to decide how much confidence they can have in it, and to use its message intelligently in reacting to a controversial situation.

The project assumes that thoughtful behavior is mediated by concepts, and that the quality of the thought depends on the adequacy of the concepts the person possesses. Comprehension of written material is an important form of thoughtful behavior. What one derives from a given piece of material depends (1) on the depth and breadth of the content, (2) on the degree to which the concepts of the reader match that depth and breadth, and (3) on the extent to which the reader possesses concepts which enable him to recognize the epistemological qualities of the passage, such as its adherence to the rules of logic, validity, and so on. If children can be helped to acquire epistemic concepts in a form which can be applied to written materials, their comprehension should improve accordingly with reference to epistemic types of discrimination. We propose to select certain epistemic concepts which play important roles in human communication, see if they can be acquired by fifth-grade children in a usable form, and if such concepts will in fact make them more discriminative readers.

We have identified a set of progressive discriminations a reader might be expected to make as he reads an article and have put them in this order:
1. What is actually said is to be determined. 2. The message is to be

identified as descriptive or prescriptive in nature, and the logical possibilities of each recognized. 3. The degree of exactness of the message is to be identified. 4. The positiveness of the message is to be identified. 5. The kind and amount of support offered for the message is to be determined. This may range from none, through hearsay, to opinion, and on to objective evidence. For the latter two, the reader should be able to discriminate between relevant and irrelevant support, adequacy of the support, validity of information furnished, believability of opinion, and verifiability of purported facts.

We are still in the early stages of the project. We have written a behavioral objective for the first discrimination: Given a written communication, the reader will determine exactly what the words say, identify any points at which the communication is not clear, and specify the degree of clarity or unclarity.

For this behavior, the student will need at least the three following concepts:

1. A response to a written communication may take any one of the following forms:

   A report of exactly what the written words say.
   A report of an estimate of what the writer may have been trying to say.
   A report of an estimate of what the writer may believe but did not actually say.
   A report of what the communication suggests or implies to the reader without actually saying it.

2. A written communication may vary in its clarity over a range in which it is possible to identify these points:

   The passage has a precise and undisputed message.
   The message is fairly clear but there is some uncertainty as to what it says.
   The passage can be interpreted equally well in two or more ways.
   The passage does not communicate any understandable message.

3. The ability of a reader to get a precise message from a written communication will vary with his own familiarity with the content of the message.

A task analysis of the first concept, based partly on having children try to respond to newspaper articles and noting the kinds of errors they make, has led us to these components:

WHAT CAN HAPPEN WHEN A PERSON WRITES (OR SAYS) SOMETHING AND YOU READ (OR HEAR) IT?

BEFORE A PERSON WRITES (OR SAYS) ANYTHING,

1. He has thoughts about something.
2. He selects which of his thoughts he wants to express.
3. He puts those selected thoughts into words and writes (or speaks) them.

WHAT A PERSON WRITES (OR SPEAKS) MAY EXPRESS

1. All, or just part of his thoughts about something,
2. His thoughts accurately or inaccurately,
3. His thoughts clearly or unclearly,
4. Something he did not intend to express.

WHEN YOU READ (OR HEAR) WHAT SOMEONE ELSE WROTE (OR SAID), YOU MIGHT

1. Identify what the words actually say, or
2. Put your own interpretation on the words, by
   a. Guessing what the writer was <u>trying</u> to say and did not quite say, or
   b. Guessing what the writer was <u>thinking</u> but not <u>willing</u> to say, either to
      1) conceal it, or
      2) misrepresent it, or
3. Think of what the words make <u>you</u> believe or decide you should do.

Two weeks ago we asked our fifth graders to read a newspaper account of the report of the President's National Advisory Commission on Civic Disorders, and then to write in their own words what the article said. After that we set aside their papers and put before them the foregoing statements about what can happen when a person reads something. After a short discussion, th stu-dents were asked to check their papers and identify which of the possible reactions they had made. To our surprise and delight they were able to do this with relatively little difficulty, in spite of the highly verbal manner in which the concepts had been presented to them. Furthermore, they seemed to enjoy this kind of behavior, and without encouragement from us some of them voluntarily brought similar clippings from the papers on subsequent days.

Now we must put this and other concepts in good conceptual form for learning so all of the students can grasp them quickly. We seem to have selected an area of human behavior in which there are no existent reading materials and no curriculum units, and we are having to rewrite the newspaper articles to scale down some of the words and phrases they contain for fifth-grade comprehension. Nevertheless the outlook is encouraging, and we believe we can soon develop some instructional units which can then be subjected to experimental testing. A year from now we hope to have behavioral objectives, subordinate concepts, and instructional materials and units for most if not all parts of the project, and some data on how well fifth-grade children can handle them.