

COGNITIVE STYLES

THE range of differences among students in intelligence, educational achievements, motivation, creative abilities, and other characteristics is well documented; however, providing adequately for known differences is just beginning to be done well in our better school systems. Sufficient research has been completed on cognitive styles so that certain styles also can be defined and measured reliably. However, no report has been found that describes classroom instruction dealing with the differences among students in cognitive styles.

Despite the lack of research information, teachers report that students perceive the same task differently, that some students comprehend situations better through discussion than by reading and independent study, that some are able to analyze and evaluate information readily in arriving at concepts and principles inductively and others are not. Thus, differences among students in styles of perceiving, cognizing, and conceptualizing are probably as real as are differences in general intellectual ability and educational achievements.

In this article three approaches to the identification of cognitive styles and related instructional concerns are first described. Then some speculations are offered concerning the widespread use of knowledge about cognitive styles in school settings.

Kagan and his associates found that some children had a preference for grouping

objects on an analytical basis. Two cognitive dispositions seemed to underlie such analytic grouping. One was the tendency to reflect over alternative solutions or classifications and the other was the tendency to perceive and analyze the array into component parts. Other children grouped objects on the basis of either a wholistic relationship between the objects or a rapid global inference. The dimension of being reflective versus acting impulsively was found to be a stable individual characteristic already in first grade (Kagan *et al.*, 1964). Later studies showed it to be a pervasive characteristic in that children who were reflective performed better in many situations (Kagan, 1965a), including reading recognition (Kagan, 1965b) and inductive reasoning (Kagan, Pearson, and Welch, 1966a).

The reflective-impulsive dimension was seen by Kagan as touching the problem-solving process at three points—when the child initially verbalizes and comprehends the available data, when he selects hypotheses, and when he evaluates the accuracy of the final solution (Kagan, 1966). Attempts were made to instruct impulsive children to be reflective. Impulsive first graders could be directly instructed to delay their offering of an answer (Kagan, Pearson, and Welch, 1966b). When placed with a teacher who was reflective they became significantly more reflective, indicating that the style could be changed (Yando and Kagan, 1968). It ap-

A DESCRIPTION

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peared that the presence of the adult model and positive reinforcement could evoke the reflective attitude.

Neither the direct instruction nor the model caused the children to be any more accurate, however. Direct instruction in the process of analyzing a stimulus or set of objects seemed required.

Various Dimensions of Style

Messick views cognitive styles as information processing habits that function across a variety of content areas. In his work at Educational Testing Service, he has attempted to devise new tests and analyze existing tests to measure exactly the factors involved in cognitive style (Messick and Fritsky, 1963; Messick and Kogan, 1963). There appear to be many styles, or information processing habits, that can be reliably and uniquely measured (Messick and Ross, 1962).

In addition to reflection-impulsivity, there are large and stable differences between students in the ability to perceive items as discrete from the background stimuli. Some people can focus successfully on the relevant part of a visual display while others perceive the display as a unified whole. One person can overcome the distractions surrounding the object of his concentration but another experiences difficulty in shutting out interferences.

People seem to differ in the size of the categories and concepts they form and use, these ranging from a few broad and vaguely defined concepts to many precise, narrow categories. The amount of ambiguity accepted varies and the level of abstraction can range from abstract to very concrete levels in different persons. Even the memory processes seem guided by either a leveling or a sharpening process. On the one hand, objects will tend to merge in memory and no longer be distinguished, and on the other, differences between events will be highlighted.

Messick feels that these cognitive styles will moderate the learning that results from educational treatments. Furthermore, to understand the cognitive characteristics of an individual, knowledge of the development and environment producing a particular style is desirable (Messick, 1968). Feshbach (1968) has echoed these concerns, saying that cognitive style can enter into the evaluation of educational procedures either by being a consequence of a procedure or as a factor in its effectiveness.

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Classroom Instruction and Cognitive Styles

Taba, Levine, and Elzey (1964) defined "styles" as the ". . . modes of thought which an individual employs rather persistently in a variety of different cognitive tasks, such as selecting a basis for grouping objects, determining how to label what he sees and how to organize the various aspects of his environment [p. 8]." Taba felt that such general qualities of thought might not be directly teachable, though the way people think may be dependent on the kinds of "thinking experiences" they have had. Thus Taba, Levine, and Elzey structured social studies experiences to develop certain kinds of thought processes and cognitive skills. Here they were not varying instruction according to the style of individuals. Rather the attempt was made to instruct all children in certain styles. Ample learning sequences were provided that would increase inductive reasoning in concept development and the capacity for analysis and abstraction.

Students were measured in three areas of information processing: (a) grouping and classifying, (b) making inferences and interpretations, and (c) hypothesizing and predicting. The teaching strategy and the content of the curriculum had a decided effect on the performance of children in classroom discussions and on the capacity to make inferences.

The students could be instructed to become better data discriminators and to reduce the amount of overly cautious inference. Asking questions which "lifted" the student response and forced the students to use grouping, hypothesizing, and predicting seemed to account for the improvements.

The curriculum focused on concepts and fundamentals in an inductive developmental sequence rather than on a multiplicity of specific facts. The inductive sequence also seemed to be an effective determiner of the level of cognitive thinking used. Educating teachers to use specific kinds of questioning sequences and to teach the *processes* of classifying, inferring, and hypothesizing, rather than existing classification schemes and

ready-made inferences and hypotheses, was apparently successful.

In Taba's view the teacher is not present chiefly to impart knowledge nor is his expertise based on the ability to use the one right method. The teacher is effective or ineffective according to the student behavior her own behavior produces. A teacher can largely control the student's responses and limit him to memory and recall or help him, force him, to use analysis, evaluation, and the like. To the extent that students are led to discover ideas and conceptual organizations on their own, they acquire progressively greater control over the information with which they deal.

What the teacher "seeks" from the student is often more important than what the teacher "gives." The role of teacher questioning becomes crucial, since it circumscribes the operations and the modes of thought to be used. Asking "What are the important cities in the Balkans?" provides poor focus. The students should rather be led to determine the criteria for the importance of cities; they should be helped in the recall of information about the Balkans; and after analyzing available information and setting up criteria they can then decide in what way various Balkan cities are important.

Following a film, a question sequence such as "What did you see? What stood out especially for you? How was the situation different from your own? Why?" stimulates and guides the search for a basis of comparing and contrasting and then reaching a general principle. "Giving" and "seeking" of information are distributed and questions are used to focus, extend, and lift the level of thought. Such question sequences can also be used to help a child reflect on alternative hypotheses, to analyze and infer and hypothesize and predict. In this sense, cognitive styles can perhaps be developed in children through instruction and practice.

Implications for Schools

The work of Messick indicates progress in identifying and measuring styles. The promising results of Taba's school-based re-

search, now being refined and moved forward into practice by the Northwest Regional Educational Laboratory, suggest that instruction can be designed to teach certain styles. Kagan also has shown that cognitive styles are developed early and guide the student in many situations. Ways of accommodating the various styles have been suggested. Impulsive children, especially boys, should perhaps be taught to read in groups led by an experienced, reflective teacher (Kagan, 1966b). A phonics approach may be effective with analytic and reflective beginning readers, while a whole word reading approach might be superior with those who are impulsive (Feshbach, 1968). Inductive teaching seems to work better for some students while deductive is better for others, depending on cognitive style and intelligence (Antonova, 1967).

Knowing a child's cognitive style may become as much a part of a school's measurement program as the IQ test. Several dimensions of style are being measured in a longitudinal study (age 3-8) of disadvantaged children (Anderson *et al.*, 1968) to determine whether unique styles of the disadvantaged students are partly responsible for their failure in school. Feshbach (1968) has described 29 individual difference variables and the tests by which the variable can be measured. One or more of these variables may influence the achievement of a student in a subject area. Analytic students, for example, are known to be superior in the ability to form certain kinds of concepts (Lee, Kagan, and Rabson, 1963; Fredrick, 1968; Davis, 1967).

Given that both teachers and students vary in their cognitive style, and that a particular style is more appropriate in one teacher-student interchange than another, it seems necessary to remain eclectic in the classroom. The same method will not always be optimal as the content changes, and it will not be optimal for all students. By presenting and seeking information in various ways, and perhaps in several ways, one can increase the range of students of varying style who "get the point." At the same time, the necessary variety of presentation will keep the teacher

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from settling into a cognitive style which may be unlike that of most of his students.

Just as reliable information about a classroom process, for example, the existence of a "warm-up period," aids a teacher to be effective with the group, so also information about different cognitive styles may help him be effective with individuals. Some students may need a quick overview rather than a point by point explanation, some may need much more experience with concrete examples than others, some may require a speeding up of information giving or a slowing down, being more complex or very simplistic. As these changes in technique are made according to the way a student oper-

ates, a teacher may be able to lead a child to more significant learning and thinking experiences.

Possibly one goal to attain, in the absence of firm knowledge about cognitive styles and related instructional practices, should be to help the student acquire and use alternatives, rather than only one method or approach. The student may then learn when a global approach is desirable and when an analytic one is necessary, in what situations gaps can be tolerated, when to be flexible, when to diverge, when to converge, and the like. These are all dimensions of cognitive style that hold considerable promise for research, development, and practice.

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