Research on Cognitive Styles: Implications for Teaching and Learning

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As we learn more about cognitive processes and modes of problem solving, we realize anew the need to design instructional programs that accommodate the unique abilities of the individual student.

A HIGH priority of curriculum design should be the development of educational programs that accommodate unique abilities of the individual student. To accomplish this task, the role of various creative and innate abilities in the teaching and learning process must be examined. One particular group of innate abilities appears to have implications for classroom teaching and learning. These abilities are frequently referred to as the cognitive styles of learners.

Identifying Cognitive Styles

What is meant by the term "cognitive style"? Generally speaking, this widely used term relates to the cognitive processes and modes of problem solving incorporated by a learner. It has been specifically defined by several writers, including Odom, McIntyre, and Neale (8), Kagan, Moss, and Sigel (4), and Grieve and Davis (2). Wright and others (13) describe cognitive style as an umbrella term covering the many ways an individual perceives, organizes, classifies, and/or labels various environmental factors. Witkin and Moore (11) suggest that cognitive style, in its broadest sense, can be thought of as a typical mode of processing information.

Several varied dimensions of the general cognitive style trait have been identified. One particular cognitive style is concerned with the manner in which individuals respond perceptually to complex configurations. The extremes of this dimension, frequently referred to as analytic/global, are categorized by ability to distinguish the components of a stimulus complex.

The Children's Embedded Figures Test (CEFT), developed by Karp and Konstadt (5), is one of several instruments which can be used to gather evidence that will provide some indication of a child's cognitive style. The test is composed of a series of items which require the subject to find simple figures embedded within a more complex one. The upper end of a continuum of scores on the CEFT identifies analytic subjects while the lower end of the continuum represents global subjects.

Research

Evidence exists to suggest the possibility that the analytic/global dimension of cognitive style is an influential variable in pupil learning, distinguishable from the IQ score

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variable.[1] Long (6) found an analytic cognitive style superior to a global style in serial learning performance. Guetzkow (3) correlated performance in problem solving with cognitive style and found that the more analytical an individual the greater his/her success in problem solving.

Studies by Davis and Klausmeier (1) and Ohmacht (9) on the influence of an individual's cognitive style on concept identification ability found that analytic subjects performed significantly better than global subjects on concept identification tasks. Grieve and Davis (2) and Thornell (10) found analytic subjects scoring significantly better than global subjects on concept attainment tests following instruction. Witkin and others (12) reported that analytic boys performed significantly better than global boys on a long-range recall task.

Together the results of these studies suggest an advantage for the analytic learner over his/her global counterpart in the elementary classroom.

A limited amount of research has been conducted in an effort to determine the potential existence of relationships between individual differences in cognitive style and various instructional methods. Grieve and Davis (2) analyzed interactions between extreme cognitive style levels and two methods of instruction, discovery and expository. They reported that extreme global males taught by an expository method experienced significant difficulty on criteria measures. Additional data collected by Grieve and Davis, along with similar studies by Nelson (7) and Thornell (10), using a median split of the sample to classify the subjects' cognitive styles, failed to find interaction effects between instructional methods and cognitive style.

[1] Herman A. Witkin and others. *Psychological Differentiation*. New York: John Wiley & Sons, Inc., 1962. pp. 67-70.

Implications for the Classroom

The sensitivity of the teacher in dealing with individual learner differences in cognitive styles in his/her classroom may be a significant influence in facilitating learning. Following the identification of relative individual differences in cognitive styles of students in a classroom, the teacher can provide a multiplicity of strategies and techniques to

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determine which seem to be most feasible, in terms of class time and effectiveness, for analytic and global children.

As mentioned earlier, Grieve and Davis (2) suggested the inappropriateness of the expository instructional method, in comparison with a discovery method, for certain global subjects. The teacher can examine the efficacy of the various methods of discovery teaching with global children to see if academic results coincide with those of Grieve and Davis. The action research may yield additional information regarding strategies that are particularly effective with children of different cognitive styles.

Also, the teacher must recognize the body of research suggesting the advantage of being analytic, rather than global, in performance of many different learning tasks in the classroom. The results of the aforementioned studies suggest that an analytic style is preferable to a global one, in terms of the particular learning tasks mentioned. Therefore, the teacher may need to put forth additional effort with the global learner. Individual curriculum counseling and planning, tutoring, and the intensified use of concrete materials are only a few of the components in instruction that may serve as valuable forms of compensatory education for the global child.

Finally, teachers can determine the degree of instructional guidance required by analytic and global children to achieve specified educational objectives. Assuming that certain children in the classroom can function effectively on an independent study basis, this would provide the teacher with information regarding the effective utilization of released time. Thus, the teacher would be able to devote additional time to the recommended compensatory instructional tasks with the global child.

True individualization of instruction should be a multidimensional complex accommodating as many learner traits as possible. The literature and research on cognitive style suggest considerable variability in the information processing modes of different individuals. These differences in cognitive styles may be significant factors in determining the type of individualized instructional program most beneficial to various students.

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