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Diann M. Dees

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**Further research must indicate whether advances in cognitive style prophesy a major change in ability measurement and the prediction of academic success.**

# Studies on cognitive style: What implications for teaching and advising?

by Diann M. Dees

In order to embrace a new theory it is often necessary to negate an old supposition. Fortunately, educators need not deny the assumption that student aptitude scores predict college performance; they need only expand the concept of "ability" to include a wider realm of skills. According to Ripple's (1977) discussion of what is needed in the student learning process, the beneficial affective characteristics involved in a maturing, well-adjusted personality (i.e. good self-esteem, motivation and socialization) are aspects of skill and should be "taught" and developed. These personality factors plus the various intellectual abilities can be summed up in the term cognitive style. When educators accord student cognitives styles the proper place of importance relative to ability, then the philosophy of educating the whole student can better be realized.

Several professors at Kansas State University have made a beginning toward this goal. Each has theorized that the student's ability to think logically, or his preferences regarding learning style or classroom environment, may be the most important factor determining success in any particular course. This hypotheses necessitates new criteria for judging whether an entering freshman would be likely to succeed at university work. In this time of retrenchment in higher education, when one wants to assure students of the best education during their years in college, one must consider what these other tests and measurements might be, and what implications they have for college teaching and advising. It would be wise for administrators and faculty at other institutions to follow the

example of Duane Acker, President of Kansas State University, who continually expresses an interest in affective student differences, as in his 1978 commencement address:

of women and men who have made lasting contributions to humanity, some were extremely bright, some had great courage and some possessed creative genius. But one characteristic was apparent in every life—uncommon persistence.

Researchers must continue to study the motivational forces which influence students to persist until they succeed. And new teaching and guidance processes suggested by a decade of study on cognitive styles must be implemented.

A major effort to study the influence of cognitive style on student success had been completed by Payne (1977). His aim has been to measure the pattern of intellectual development in architectural design students and make use of the resulting data to improve teaching and learning. In order to link this data about their intellectual development, which he terms "learning style," to better classroom teaching, Payne explains the concept to the students in a short unit of testing and classroom discussion. He introduces his faculty to the concept by measuring their learning styles, as well, and by presenting teaching suggestions which logically result from differences in faculty and student's abilities to think abstractly.

Payne's basis for study of these cognitive styles is the model of learning established by Jean Piaget (1958), the Swiss epistemologist and psychologist: all university students and faculty are progressing, or have progressed, through Piaget's four stages of intellectual development. Payne measures these developmental differences on instruments used by Suehr and Rose (undated) and Kolb, Rubin, and McIntyre (1971). These tests require the individual to rank four columns of words about learning—often with emotional connotations—according to how they represent his own intellectual functioning. A scoring key designates those words in each column which are descriptive of each of the four styles. Payne hypothesizes that the four resulting scores indicate the individual's preference for learning in one of Piaget's stages of development. This hypothesis assumes that all stages are at least verbal and at the level of concrete operations, with the first two learning styles only symbolic of Piaget's first two stages.

Several problems are inherent in Payne's hypothesis and in these learning style instruments. Some of the questions which come to mind are:

Is the hypothesized relationship between Piaget's model and the four Learning Styles supportable?

Is there any construct validity in the Learning Style Assessment?

What is the reliability of the instruments?

Is it justifiable to plot these KSU freshmen scores on a graph based on norms established with Harvard and MIT graduate students in Business?

Research indicates that college freshmen, in particular, have difficulty with the vocabulary of this test, and that four distinct cognitive styles are not as clearly delineated as Payne's research might lead one to think. Also, faculty members differ from discipline to discipline in their classroom emphasis on one of the four intellectual processes of the Kolb, et al. (1971) test.

But is the study of cognitive style and the perfection of measurement instruments the main issue in Payne's work? I think not. Nor is it the purpose of this paper to try to argue these technical and theoretical issues. Payne has stated that his purpose is not to interpret the learning styles of individual students, but to make clear both the differences in student cognitive structure from year to year, and the teaching implications which result. He uses Piaget's four stages to demonstrate that all students must progress through stages of reasoning skill. One of the main difficulties with Payne's hypothesis and instruments might be solved by considering his Learning Style concept a misnomer for ability to reason concretely or abstractly, without the affective bias. The redesigning of testing materials so that they better reflect Piaget's concepts might eliminate most of the confounding effect of affective vocabulary, and differentiate student attitude toward teaching for a separate study.

In his review of related research, Payne (1977) indicates that there is a correlation between teaching methods and student positive and negative attitudes (e.g. intellectual curiosity and anxiety). Although his paper discusses teaching in the architecture design studio, its importance to other disciplines is clear: college students who have not reached the level of intellectual development necessary for the course content and instructor's teaching style will not learn as much. In addition, those students may not even be curious, but instead develop only negative feelings.

This problem is compounded by the fact that students and faculty alike are generally unaware of the fact that many individuals have not developed the necessary intellectual abilities before coming to college. Many freshmen and sophomores probably do not recognize that they must and can systematically improve their skill in abstract conceptualizing and must accept a large part of the responsibility for this teaching and learning. And faculty often do not perceive the conflict which may arise when they prefer to learn and teach in one style (e.g. study and discussion of theory or philosophical concepts) and the students are prepared only to learn empirically, through concrete experiences.

As Payne (1977) outlines in detail, there is also a problem of role-identification for many instructors. They may be expected on the one hand to teach the content of a syllabus to a group of students, while developing necessary skills and emphasizing the body of knowledge as they see fit, and, on the other, to encourage individual development in each student, leading him from his entrance level to the level of proficiency needed by the end of the course. These two tasks are often not easy to reconcile. Those instructors who have spent years of graduate study with a dissertation director and a limited number of professors, working at the highest level of abstract thought, may find it difficult to teach basic concepts to large classes of undergraduates, let alone understand the problems of freshmen.

In fact, McKinnon and Renner (1971), recognizing the circularity of the problem, cite college teacher-preparation as the cause of poor student preparation in the public schools. They write that many entering freshmen do not possess necessary intellectual abilities because their public school teachers did not receive the necessary type of inquiry-oriented instruction in college so that they, in turn, can bring about in their pupils the highest level of intellectual functioning, what Piaget calls "formal op-

erations," or the ability to consider abstractly alternative solutions to a problem.

Payne's (1977) solution to this teaching and learning predicament is twofold: to begin by recognizing that the difficulty exists, and "to raise the awareness of both students and teachers to the implications of the relationship between learning styles and teaching methods" (p. 14). When the instructor and all of the students become aware of their learning preferences and abilities, there is a common ground from which to progress in teaching and learning.

Payne's conclusions parallel those of R. Stimson Wilcox, who has studied the learning behavior of biology students. By applying Piagetian theory to his curriculum design, Wilcox discovered that many students are not at the formal operations stage of reasoning needed to learn the course content. He became aware of this problem because of the students' demonstrated inability to think through the tasks he set for them in the laboratory. He published his findings with his associates Lawson, Carlson, Sullivan, and Wollman (1975), in the format of a faculty workshop, **Biology Teaching and the Development of Reasoning**. This workshop was "the first concerted attempt to apply Piagetian ideas specifically to biology instruction." The teaching objectives and methods used by Wilcox and his associates are an excellent response to the need for providing college students with necessary experiences for developing logical thought processes. However, the effect of student personality differences on academic performance must also be scientifically addressed. It has become clear after years of study that cognition does not wholly determine why some students are unsuccessful in class, although their aptitude tests indicate the same ability as others who do succeed.

In an effort to investigate the effect of personality factors on learning, Hanna, Newhouse, Hudson and Kalb (1976) in their Educational Psychology classes conducted a study to determine whether students matched to instructors according to preferences for certain instructors' traits would have better final attitudes and course performance than those students who were poorly matched according to the same criteria. The authors concluded that because of the small number of instructors and students in their study, they were neither able to establish that the matching experiment was successful nor to generalize their findings. Although the authors termed these results "resoundingly unencouraging," their brief article may have contributed more by its skillfully documented lack of success than an auspicious piece of research that tells us little. For, significantly, they indicate in their final paragraph another aspect of learning which should be studied: "it is possible that some positive affective changes might be fostered (or hindered) by matching" (p. 370). It is unclear whether the authors would interpret "instructors' traits" in the sense of the affective learning style responses as defined by Mann (1971), and Grasha (1972), who maintain that students can be classified into styles by their subjective emotional attitudes toward learning and teaching; or according to those of Kolb, Rubin and McIntyre (1971), who, along with Suehr and Rose (undated), advocate identifying predominant learning styles by measuring a mixture of attitude and intellectual ability, and recommend balancing these abilities in four dimensions. The latter believe that once a balance of skill is reached in the four "styles" of their test, reasoning can proceed no matter what the level

of concreteness or abstractness in the problem to be solved.

According to this viewpoint, the instructor should seek to foster intellectual development either by modifying his own teaching style to suit student needs or by helping them improve their learning skills to meet the demands of his teaching methods. However, the matching of students to instructors causes some educators to fear that the result will be a conforming adaptation without creative growth. Depending upon the criteria selected for matching, it may create a static classroom situation in which the affective learning goals might be seriously hindered, as Hanna, et al. noted.

A belief in the importance of these affective learning goals led to an attempt by Jerome Dees to modify Payne's learning styles discussion in an English Composition I course. He sought to determine the learning styles of his typically diverse class and adapt his teaching so that more students would successfully complete the departmentally prescribed syllabus. He hoped that the learning styles discussion would lead students to understand better their strengths and weaknesses so that they would have an improved attitude toward themselves and this required course. The instructor's rejection of the concept of student and instructor matching was in part based on the philosophy of McKeachie (1978) who believes that such assigning is "possibly undesirable" because students would lose a variety of learning experiences, and that such decisions are generally based on data that are too unreliable. McKeachie further believes that teachers can be trained to teach effectively those students with different learning styles and interest levels, and that it should be a reciprocal learning experience (p. 204). Unfortunately, while in basic agreement with this philosophy that the instructor can modify his methods to meet the needs of various students, Dees found that following the departmental syllabus did not easily permit the needed individualization. Test results revealed many cognitive styles and skill levels among his students, a situation which suggested the need for a tutorial approach to teaching the course. However, the traditional teaching model of the didactic instructor and the passive student is implicit in many composition courses: the instructor demonstrates how to write and the students duplicate the method whether their cognitive style is verbally oriented, or not.

The problems involved in individualizing the teaching of a course structured like Composition I illustrate some of the many unfavorable teaching conditions which limit the instructor's ability to increase student achievement. These factors doomed the pilot study to limited success. Nevertheless, the research was useful in that it both suggested ways that cognitive style knowledge can be made of greater use to students and instructors, and tested whether a full-scale experiment would require the use of new testing materials. The Dees study also sought to test one of the main objectives which Payne (1977) described in his conclusion, that is, the value of "making conscious and explicit attitudes and assumptions that are normally implicit and often unclear and confusing" (p. 14). Although no definite conclusions can be drawn from the class discussion with the Comp I students, it seems likely that these attitudes and assumptions not specifically dealt with in the Hanna et al. (1976) experiment may be important factors in course success. Furthermore, the positive affective changes that can result from cognitive

style discussion, and resulting self-perception, might be looked upon as the "silent curriculum" described by Hosford (1976), who stated that there is seldom the same time given to its planning and evaluation as to that of the basic curriculum concerns. The goal of the silent curriculum is to foster a desire for learning, the development of a healthy self-concept and a respect for others.

Further research must indicate whether advances in cognitive style knowledge prophesy a major change in ability measurement and the prediction of academic success. The fact that instruction about pupil learning styles is being used to increase the adjustment of elementary and secondary school children, also, demonstrates that the importance of a favorable and realistic self-concept may be a counseling and teaching dimension too long neglected as an issue in academic measurement. It is hoped that future studies involving cognitive style and achievement will corroborate this belief, and point to the need for a new emphasis on the interaction of curricula, materials and teaching styles for the furtherance of student success.

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