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ABSTRACT

In light of recent research suggesting links between learning style and culture, this review of the literature looked at the various definitions of learning style, reviewed a framework for categorizing the types of instruments used to assess learning style, and explored the literature on learning style research among diverse groups. The study reviewed definitions of learning style versus cognitive style and explored learning style theories including personality models, an information processing model, and the social interaction model. The study also explored research on learning styles among diverse groups at the postsecondary level and found that much of this research finds that learning styles may follow cultural patterns. Exploration of the implications of the relationship between learning styles and cultural diversity for higher education instruction led to the conclusion that colleges and universities should conduct professional development activities on the use of learning styles in improving teaching and student development, that classroom research in this area should be promoted, that curricular experiences should help students learn how to learn, and that search committees should take candidates' understanding of teaching and learning practices into account. (Contains 32 references.) (JB)

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Learning Styles: A Review of the Literature

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July 1995

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Learning Styles: A Review of the Literature

I. Introduction

An emerging issue in higher education is the use of learning style research to create more positive, effective learning environments for all students. In the past, learning style research in the United States focused primarily on examining individual learning style preferences among white, male students from middle-class backgrounds Recently with the increased social and cultural diversity in college classrooms, researchers have begun to raise questions about the mediating influence of culture in learning style differences. A number of studies have begun to suggest that group patterns do exist and that, in general, culture plays a part in the development of learning style. The focus of this paper will be to consider the various definitions of learning style, review a framework for categorizing the types of instruments used to assess learning style, explore the literature on learning style research among diverse groups, and finally discuss the implications of the research for higher education.

II. Definitions

An array of definitions for the term "learning style" can be found in the literature. In the earlier days of this type of research, the term "cognitive style" was used rather than learning style. Cognitive style has been defined in several different ways: (1) cognitive characteristic modes of functioning that are revealed through one's perceptual and intellectual activities in a highly consistent and pervasive way; (2) a superordinate construct involved in many cognitive operations that accounts for individual differences in a variety of cognitive, perceptual, and personality variables; and (3) intrinsic information processing patterns that represent a person's typical

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modes of perceiving, remembering, thinking, and problem solving (Claxton and Murrell, 1987; Griggs, 1991).

According to Kirby (1979) the term "learning style" came into use when researchers began looking for ways to combine course presentation and materials to match the needs of each learner. From this perspective, learning style is considered a broader term that includes the construct of cognitive style. In 1978 Claxton and Ralston defined learning style as a student's consistent way of responding to and using stimuli in the context of learning. Reichmann's definition, also formulated in 1978, refers to learning style as a particular set of behaviors and attitudes related to the learning context. Later, Scarpaci and Fradd (1985) defined learning styles as "ways in which individuals perceive, organize, and recall information in their environment" (p. 184). However, the most comprehensive definition, eventually adopted by The National Association of Secondary School Principals, came from Keefe (1979) who defined learning style as the cognitive, affective, and physiological factors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment. Claxton and Murrell (1987) doubt that any final agreement on definition will be reached until further research has resulted in a more refined theoretical base.

III. Framework for Categorization

A helpful way to organize the growing number of learning style theories is Curry's (1983) metaphor of an onion in which the layers of the onion are analogous to the different levels of a person's characteristics or style. At the core of the onion is style in the sense of basic personality traits. Instruments developed within this research area assess the influences of basic personality on preferred approaches to

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acquiring and integrating information. The next layer, information-processing, is the individual's preferred intellectual approach to assimilating information. Social interaction, the third layer, addresses how students interact in the classroom. Finally, the outer layer of the onion is concerned with instructional preference, the individual's preferred environment for learning. According to Claxton and Murrell (1987) and Griggs (1991), the traits at the core are the most stable and thus are the least subject to change in response to intervention by the researcher or instructor. As the levels proceed outward, the preferences become less stable and more susceptible to change. Curry's framework for categorizing learning style models is useful for reviewing the various types of instruments developed to address specific dimensions within the broader agenda of learning styles research. The instrument types include personality models, information processing models, social interaction models, and instructional preference models.

Personality Models

One personality model that has greatly influenced the field of learning styles is Herman Witkin's (1976) bipolar construct of field dependence and field independence, which measures the extent to which a person is influenced by a surrounding field. His *Group Embedded Figures Test* (GEFT), just one of the instruments developed for this purpose, identifies how accurately one can pick out a simple object within the context of more complex figures (Claxton and Murrell, 1987; Griggs, 1991). Field independent individuals, those who are able to perceive the figures in the midst of the surrounding field, function more autonomously because their reliance on internal referents allows them to structure situations on their own. On the other hand, field dependent or field sensitive people, those who are unable to pick out the figures, are more influenced by

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and sensitive to their environment, including other people. They use their entire surroundings to process information. In a class, for example, field sensitive students are as concerned about the human relational interaction and communication style of the instructor as they are about the delivery of the content (Anderson and Adams, 1992; Griggs, 1991; Hvitfeldt, 1986).

According to Claxton and Murrell (1987), one must understand that the world is not filled with only two types of people -- field dependents and field independents. "Rather, a person's standing on this dimension is described by his or her position relative to the mean" (p. 9). An individual's make-up in terms of this construct seems to develop out of a combination of genetic factors and socialization and childhood experiences (Witkin, 1976).

Another personality model of interest in learning styles research is the *Myers-Briggs Type Indicator* (MBTI), an instrument designed to help apply Jungian theory in counseling, education, and business (Myers, 1976). Jung's theory states that the world can be perceived by either sensing or intuition and that people use either thinking or feeling to make decisions. In addition to one's preference on both of these mental functions is an accompanying preference for extraversion or introversion and for a judging or perceptive attitude toward life (Claxton and Murrell, 1987; Griggs, 1991).

The MBTI assesses the relative strength of the four dichotomous processes of extraversion versus introversion, sensing versus intuition, thinking versus feeling, and judging versus perception. Extensive research conducted in the 1960s gave indirect evidence of differences in learning style by type . The MBTI is a comprehensive instrument, and those who have taken it typically report that it describes their

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personality well (Claxton and Murrell, 1987; Eison and Pollio, 1985; Griggs, 1991; Lawrence, 1984).

Information Processing Model

The second layer in Curry's (1987) onion deals with how people process information. One well-known instrument is David Kolb's *Learning Styles Inventory* (1976), which is based on the theory of experiential learning. According to Claxton and Murrell (1987), this theory deals not only with style but also with the more basic question of learning and individual development. Kolb (1984) has drawn on the work of Dewey, who stressed the need for learning to be grounded in experience; Lewin, who emphasized the importance of a person's being active in learning; and Piaget, who described intelligence as the result of the interaction of the person and the environment.

Kolb (1984) describes learning as a four-step, cyclical process. It begins with concrete experience, which is full involvement in the experience. The next step is reflective observation, thinking about the experience from different perspectives. Third in the process is engagement in abstract conceptualization, creating generalizations or principles that integrate observations into sound theories. This finally leads to active experimentation where the learner uses these generalizations or theories as guides to further action, testing what he or she has learned in new, more complex situations. This results in another concrete experience, and the cycle continues (Claxton and Murrell, 1987).

The four points on the experiential learning cycle are modes of dealing with information or adapting to the world. From the juxtaposition of these points, Kolb (1976) developed four learning styles. The first group, divergers, perceive information

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concretely and process it reflectively. They are called imaginative learners because they integrate experiences with the self and need to be personally engaged in the learning process. The second group, the assimilators, perceive information abstractly and process it actively. They are pragmatists and place a high value on skills development and problem solving. Next, convergers perceive information abstractly and process it reflectively. They learn by sequential thinking and are attentive to detail and thoroughness. The fourth group, accommodators, perceive information concretely and process it actively. They are dynamic learners who relish change, risk-taking, and flexibility (Claxton and Murrell, 1987; Griggs, 1991; Kolb, 1984).

One of the most recently developed learning styles assessment instruments is *The Gregorc Style Delineator* (Gregorc, 1982a). It is similar to Kolb's model and represents Gregorc's mediation or cognitive ability theory which states that "the human mind has channels through which it receives and expresses information most efficiently and effectively" (Gregorc, 1982b p. 5). Gregorc attempts to measure the cognitive abilities of perception, ranging from concrete to abstract on a bipolar continuum, and ordering, ranging from sequential to random also on a bipolar continuum. Gregorc combines these abilities to form four learning styles, and the instrument identifies the relative strength of the four styles. While he is clear that all individuals have some ability in all four learning styles, Gregorc maintains that most people exhibit a natural predisposition toward one or two of the styles (Gregorc, 1982b; Thompson, 1991).

The four learning styles include concrete sequential, abstract sequential, concrete random, and abstract random learners. Concrete sequential learners prefer direct, step-by-step, orderly and sensory-based experience. Abstract sequential types

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have strong symbolic systems and a preference for learning through reading and listening to logical presentations. Concrete random individuals use trial-and-error, intuitive, and independent approaches to learning. Finally, abstract random learners evaluate learning globally and prefer to learn in an unstructured, experiential manner (Claxton and Murrell, 1987; Gregorc, 1982a; Griggs, 1991).

Social Interaction Model

The social interaction model addresses how students interact in the classroom. *The Grasha-Reichmann Student Learning Style Scale* is one such model which was developed over a two-year period of conducting interviews with students at the University of Cincinnati (Grashna, 1972). Students' responses to questions concerning their attitudes toward learning, views of instructor and/or peers, and reactions to classroom procedures, revealed three contrasting styles: dependent-independent, competitive-collaborative, and avoidant-participant. Six student-response styles became apparent, and the six learning styles thus developed. Dependent students lean heavily on authority figures to define the parameters of learning; on the other hand, independent students like to think and work on their own but will listen to others. Competitive students view learning as a win-lose encounter and are motivated to learn in order to excel in comparison to others. In contrast, collaborative students prefer to learn in a peer or social context through cooperative approaches. Finally, avoidant students are not actively involved in class and are not interested in learning course content while participant students perceive the learning environment as an opportunity to interact with others as well as learn course content (Claxton and Murrell, 1987; Griggs, 1991).

Instructional Preference Model

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This outer layer of the onion is a multidimensional model which addresses the variations among learners within the context of the learning process. One such model is Canfield's *Learning Style Inventory* (1980). An industrial psychologist, Canfield drew heavily on the cognitive style mapping work of Joseph Hill, Maslow's hierarchy of needs theory, and McClelland's research of achievement motivation (Claxton and Murrell, 1987).

Canfield (1980) developed scales in four areas. The first concerns conditions of learning, including affiliation (the student's need to develop personal relationships with other students and the instructor), structure (their desire for organization and detail), achievement (their desire for goal-setting and independence), and eminence (their orientation toward competition and authority).

The second area deals with student preferences concerning content. This includes numerics (working with numbers and logic), qualitative (working with words or language), inanimate (working with things, such as in building or repairing), and people (working with people, such as in interviewing and sales).

The third and fourth areas assess mode and expectations. Student preferences in term of mode include listening, reading, iconic, and direct experience. The area of expectation has to do with the grades students think they will receive (Canfield, 1980; Claxton and Murrell, 1987).

Canfield and Canfield (1986) also developed *The Canfield Instructional Style Inventory* which considers generally the same dimensions as the learning style instrument. It provides a vehicle for communication between students and faculty about course design and learning activities. Canfield (1980) and others (Brillhart, 1981; Brillhart and Debs, 1982; Ommen, Brainard, and Canfield, 1979) have

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conducted a number of studies using both the learning and the instructional style instruments to address various concerns about matching learning and instructional styles.

IV. Learning Styles Among Diverse Groups

Most of the research on learning style in the U. S. has been done from a Western, white, middle-class perspective and value system. However, the rich racial and cultural diversity of American society underscores the critical need for more research into the learning styles of diverse student groups. This is especially true for higher education since very little research has been done on the learning styles of students of color at the postsecondary level. Although the purpose of studying learning style is to understand and value individual differences, the research that has been done across different cultural groups suggests that cultural patterns do exist.

In 1984 The Learning Style Profile, an instructional preference instrument, was administered to 4,562 students in grades six through twelve in forty schools throughout the U. S. The ethnic make-up of the students was 1.9% Asian-American, 8.9% African-American, 1.9% Hispanic, 2% Native American, 84% white, and 1.3% other. Among 27 variables, analysis of variance indicated that 18 variables had significantly discriminated among group differences. Griggs and Dunn (1989) reported group extremes on the 18 variables. Some examples of these group extremes are as follows:

1. Sequential processing skills: Whites scored higher than African-Americans
2. Verbal spatial preference: African-Americans scored higher than whites
3. Auditory preference: African-Americans scored higher than others
4. Bright light preference: Native Americans scored higher than Hispanics

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5. Need mobility: Hispanics scored higher than Whites

Other studies with children have identified certain groups as having strong visual perception in comparison to auditory, tactile, or kinesthetic modalities. These groups include Native American, Alaskan Eskimo, and Mexican-American children (Jalali, cited in Griggs and Dunn, 1989; John-Steiner and Osterreich, 1975; Kleinfeld, 1973; Mariash, cited in Griggs and Dunn, 1989).

According to Griggs and Dunn (1989), other research comparing the learning styles of children from various cultural groups has also suggested group differences. For example, a comparison of African-American, Mexican-American, and Greek-American elementary school children found that Greek-American children had significantly stronger auditory preferences than did African-American children. African-American children had significantly higher kinesthetic preferences than did Greek-American children, and Mexican-American children had stronger tactual preferences than did Greek-American children.

Cross-cultural research on the theory of field independent/field sensitive cognitive styles found strong relationships between cognitive style and culture. Ramirez and Castaneda (1974) and other studies cited by Ramirez (1982) found that on the average young Mexican-American and African-American students are more group-oriented, more sensitive to and distracted by the social environment, and more positively responsive to adult modeling than were white students on the average. Furthermore, the research data support the description of students of color as being, in general, "less competitive, less sensitive to spatial incursions by others, less comfortable in trial and error situations and less interested in fine details of concepts, materials or tasks that are non-social" (Ramirez, 1982, p. 2). Ramirez notes that these

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behaviors are often included in a description of a field sensitive approach to learning.

Ramirez and Castaneda (1974) developed a model of cultural effects on socialization and learning style preference in which they hypothesize that the predominant or general teaching style of a family may be of basic importance in deciding the direction a child's learning preferences takes. For example, in some families children may learn many things by observing and imitating what they see older people doing. From observation they learn the importance of how people relate to each other and who does what in the family. Other families may encourage children to experiment and find things out for themselves at an early age. They learn to work things out for themselves by trial and error. Ramirez (1982) writes

> Insofar as these teaching styles reflect a certain set of values held by the parents and family, values that in many cases are clearly culturally determined, one may posit that cultural differences in learning style preferences develop through children's early experiences. (p.5)

Little cross-cultural research has addressed learning style differences at the postsecondary level; however, that which has been done suggests the existence of cultural differences. One such study by Scarpaci and Fradd (1985) compared the field sensitivity of Anglo-American and Latin-American university students. The results indicated the same clear differences that Ramirez and Castaneda found in terms of the Anglo-American students exhibiting more of a field-independent learning style preference and the Latin-American students indicating more of a field-sensitive learning style preference.

In another study, Lam-Phoon (1986) compared the learning styles of 143 Asian and 166 Caucasian college students using the Productivity Environmental Preference

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Survey, an instructional preference-type instrument. Using multivariate analyses of variance and discriminant analysis, she found that Asian and Causcasian students' learning styles were statistically different from each other. Caucasians had a higher preference for warmth, intake and mobility while learning; they were more conforming and remembered less well auditorially and visually.

The learning styles of Native American students in a community college biology class were studied by Haukoos and Satterfield in 1986. They gathered data on twenty native students and 20 nonnative students. The groups were nearly identical in age, educational background, and other variables but differed in race, culture, and socioeconomic status. The results of the study showed that the native students preferred not to express themselves orally and considered themselves visual rather than auditory learners. In contrast, the nonnative group preferred to express themselves orally and indicated they were auditory learners.

In their chapter in the 1992 publication *Teaching for Diversity*, Anderson and Adams cite several studies which support the hypothesis that the learning styles of white women, non-European, and nonwhite students differ from the traditional college population. In general, the patterns that emerge among the nontraditional groups include more competence in peer cooperation, visual perception, symbolic expression, and narrative. In addition, they indicate less comfort with tasks that require verbal skills, competition, and independence.

Anderson and Adams (1992) also discuss findings from cognitive psychology and anthropology which provide evidence of differences among Americans from African, Asian, Hispanic, and Native American heritages. According to the research, these differences occur in information processing, memory, problem

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> solving, and thinking. . . . Studies that have examined different groups' orientations to cultural values (human nature, nature, human activity, time, social organizations) support the contention that nontraditional groups who share common conceptualizations about basic values, beliefs, and behaviors exhibit similar socialized differences and stylistic learning preferences. (p.21)

Claxton and Murrell (1987) end their report on learning styles and improving educational practices by noting that a pressing need exists to learn more about the learning preferences of diverse student groups. They regard the near void in the literature as particularly serious in view of the increasing numbers of students of color, both American and international, that higher education serves.

V. Implications for Higher Education

Many researchers caution against oversimplifying the concept of learning styles and group differences, and they express concern about the danger of using results from cross-cultural learning styles research to further stereotype or label particular student groups. However, identifying individual differences that are educationally meaningful is very important. Many researchers agree that if used responsibly, learning style research could play an important role in improving both teaching and learning in higher education (Claxton and Murrell, 1987; Griggs and Dunn, 1989; Ramirez, 1982).

Ramirez (1982) suggests a framework that both builds on students' preferred ways of learning and encourages them to develop previously underdeveloped approaches to learning. He believes teachers should utilize and extend the strengths and learning characteristics that individual students have developed through prior

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experience by providing comfortable learning situations based on preferred styles. In addition, Ramirez advocates helping students become more comfortable and successful functioning in ways that they have not previously experienced.

Claxton and Murrell (1987) make four recommendations for institutions of higher education interested in utilizing the information on different learning styles to improve the teaching/learning process.

1. **Conduct professional development activities on the use of learning style in improving teaching and student development**. This recommendation includes conducting workshops as well as obtaining minigrants for instructional improvement projects. The focus of these activities should be on helping participants better understand the importance of style and its role in improving students' learning.

2. **Promote classroom research and make data about learning style an important of it**. Included in this recommendation is the concept of broadening the definition of research to encompass that which is done not only in the specialized disciplines but also in teaching-learning processes. Claxton and Murrell maintain that when linked with other data on students, information on style holds great promise for helping faculty members improve their teaching.

3. **Establish curricular experiences that focus on helping students learn how to learn**. In addition to orientation activities or short courses designed to help students better understand how learning occurs, learning styles inventories can be used to help make them aware of their own preferences and strengths. Attention should also be given to helping students develop strategies for succeeding in courses that are taught from a style that is incongruent with their primary learning style

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preference.

4. **In hiring new faculty members, search committees must take into account candidates' understanding of teaching-learning practices.** Although the emphasis is still on research in many institutions, a greater realization exists that faculty preparation should include other areas of knowledge as well. A background in student development, learning theory, and ways to creatively combine content and process are all important prerequisites for effective teaching.

Anderson and Adams (1992) point to diverse styles of teaching and learning as potential assets to American higher education. For them, the key is for both professors and students to be willing to develop flexible teaching and learning styles so that both will develop multiple modalities through which to perceive, interact with, and respond to the learning environment.

An additional recommendation is for those who teach in higher education to examine the characteristics of excellent teaching professionals who are associated with successful programs for diverse students. Such characteristics include, according to Anderson and Adams (1992), self-assessment of skills and weaknesses, a student-centered attitude, a repertoire of alternate teaching strategies, perspectives that reflect a respect for diverse views, excellent preparation and organization, techniques that encourage independent and critical thinking, and interpersonal skills that motivate students and facilitate learning.

In 1969 Cohen described the predominant teaching style at all levels of U. S. education as the analytical style of the white middle class. This style incorporates most of the characteristics of field independence and has manifested itself in the lecture/notetaking format in college classrooms. Over the years, this teaching style

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has not changed significantly in higher education. However, there is a question as to whether or not that particular teaching style ever met even the needs of all traditional students. Furthermore, it is clear that it has not met the needs of many other learners since the research shows that white women and most students of color in the U. S. tend to exhibit a more field sensitive style. The exciting news is that as professors focus on developing more of the characteristics of excellent teaching, they will actually improve the quality of education for **all** learners.

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