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ABSTRACT

A review is provided of recent literature on learning styles and teaching styles, and the relationship between the two. First, a discussion of learning styles is presented, focusing on the cognitive, affective, and physiological aspects of the learning process and situation. Next, the paper addresses the issue of the development of individual cognitive style, stressing that teachers can influence style changes in students. In the next section, the relationship between teaching and learning style is addressed, indicating that instructors tend to prefer to teach the way they prefer to learn unless a conscious effort is made to do otherwise; that choice of teaching area seems to be somewhat dependent upon personal learning style; that left-brain oriented instructors tend to be more systematic, structured, and organized, while right-brain oriented instructors tend to be more flexible, group-oriented, and creative; and that teachers should understand their own teaching and learning styles to be able to modify their approach depending on the circumstances at hand. A brief overview of brain research with respect to learning styles is followed by a series of suggestions for teachers to help them recognize different aspects of learners. Next, research on the effectiveness and desirability of matching teaching and learning styles is reviewed. Concluding comments suggest that instructors make the instructional changes which allow students a better opportunity to learn and to be more responsible for their own learning. (AYC)

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TEACHING AND LEARNING STYLES

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Introduction

The process of teaching and learning is one which not only is of interest and importance to many educators but to non-educators as well. With our rapidly changing world, an increased public interest in learning or perceived lack of learning seems to be developing. Our capacity for learning is one variable which sets us apart from the rest of natures living kingdom and may be a major reason for our interest in how learning occurs.

Each of us have unique ways of teaching and learning and these activities are undoubtedly some of the most complex interaction in which we are ever engaged. We also share some similarities in how we learn. Simplistic attempts used to describe these interaction seem to be inadequate and lack relevance for the teacher or the learner.

Interest in learning and how we learn is certainly not new. The philosophers of ancient Greece and Rome developed ideas about learning that dominated educational thinking for centuries and are even influential today. For example, Aristotle's mnemonic techniques of association and visual imagery are used widely in education and training and the Greeks' temperament classifications of sanguine, choleric, melancholic phlegmatic laid the basis for much of the work done in personality types during the past 50 years (Keefe, 1979).

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We are in a challenging and exciting time as educators We know more now about the brain than we ever have before and the last decade has revealed fascinating insights in brain functioning and learning. We seem to be more willing to investigate learning in a multidisciplinary fashion using the work and research done by psychologists, neuroscientists, linguists, anthropologists as well as educators. This approach will hopefully allow us to avoid the pitfalls of a too limited scope of thinking and oversimplification. The balance of this seminar will review the current thinking on teaching and learning styles and discuss the implications of some of the approaches.

Learning Styles

The definition of style that best fits this discussion is one from the American Heritage Dictionary which reads: "individuality expressed through one's actions and tastes." When we learn, we use a style that is uniquely ours, but we make "in process" adjustments based on the nature of the task and the teaching style being used (Cornett, 1983.). This suggests that learning styles must not be studies in isolation but must consider the conditions and context in which the learning is taking place.

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Learning styles and their assessments may be categorized based on the cognitive, affective or physiological aspects of the learning process and situation.

Cognitive learning styles focuses on the ways in which we decode, encode, process, store, and retrieve information. Does our cognitive style engage in the elements above through focusing or scanring, random or sequential process, concrete or abstract process? Each of these pairs represent a continuum of types of cognitive processes. Although an assessment would place an individual at a specific location on each continuim, each of us typically has the capacity to use each process to some degree. We simply tend to use one end of each pair more than the other.

Our cognitive learning styles can be partially related to hemispheric brain functioning with the ends of the paired process relating to either the left or right hemisphere. Our capacity for using each type of process in each pair can be explained by the corpus callosum which is the information sharing mechanism between the brain hemispheres. For example, we may approach a problem randomly, which would relate to right hemisphere functioning, and the problem may need to be solved sequentially, which is the left hemisphere. Given time and guidance, we can probably switch our orientations.

The more we as educators know about the learning cognitive style, the more likely it is that our choices for

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interaction will be effective. We may have to paraphrase, ask more questions, be more explicit, provide different materials, establish different time frames, etc.

Affective learning styles deal primarily with emotional and personality characteristics. This area is related to motivation, attention, loss of control, interests, risk taking, persistence, responsibility and sociability.

This area may be one of the least understood by educators in higher education since most of their orientation and education is focused in the cognitive domain. An understanding of some of the variables at work in this area can be helpful to the educator who is at a loss as to why external rewards or encouragement have a positive effect on some learners and receive a negative reaction from others. A frequent response frc the educator is a refusal to accept any responsibililty or accept little responsibility for what occurs in this domain. This attitude is described by Ken Eble in the Craft of Teaching when he lists the myths of teaching. O.e of these great myths is that good teaching ignores the personality of the teacher and the learner (Eble, 1978).

Physiological learning styles include sensory interaction, environmental elements, nourishment needs, and time of day. The environmental work done by Rita & Kenneth Dunn include noise level, light, temperature, room arrangement, etc. (Dunn, 1978). While Walter Barbe and Raymond Swassing

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have looked at perceptual elements which include visual, auditory, kinesthetic, taste and smell (1979).

With advancements in medical technology, new understandings of how the human system, especially the brain, interacts with its environment are becoming possible. Brain scanning allows medical researchers to discover what areas of the brain are actively responding when different conditions are present. These conditions extend even to those activities related to memory and learning.

We must not fall into the trap at this point of overemphasizing sensory and environment elements of learning styles because they are more easily understood. M.C. Wittrock says this best when he describes instruction as follows: "instruction cannot be thoroughly understood by attending the the apparent qualities of treatment. . . mental transformations performed by different people determine whether instruction is rote or meaningful, whether it stimulates verbal or spatial processes and whether it facilitates learning and memory (1978)."

Development of Learning Style

I have defined learning style as a consistent pattern of individual behavior. It does, however, change with age and experience (Epstien, 1978). For example, the more mature learner tends to have a higher level of abstract ability and is more field independent than the less mature

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learner. This trend in maturation is confined to technical societies, which seems to support the effects of the left-brain oriented curriculum in most U.S. schools (Fox, 1979). American students from Mexican and American Indians do not, for example, show the same pattern of cognitive development. Manual Ramirez and Alfredo Castaneda found that American Indians educated in their own schools tend to become more field dependent, the opposite of their Anglo counterparts.

Jean Piaget and Lawrence Kohlberg (1975) have described discrete stages of cognitive development which are influenced by peers, parents, or teachers using cognitive processes slightly beyond the given student, and growth in moral reasoning. The important point here is that teachers can influence style changes in students by modeling many of the styles. Kohlberg suggests an appropriate level of tension be created which stretches the student toward the development of their cognitive skills.

Relationship Between Teaching and Learning Style

Since each of us who are teachers are also learners, each of us has a learning style as well as a teaching style. Our learning styles are likely to have more variations in them than our students because we have usually had more experiences. Regardless of what our preferred learning style is, it will have an effect on our teaching style

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(Cornett, 1982). In short, we tend to prefer to teach the way we prefer to learn unless we make a conscious effort to do otherwise.

What about the reverse situation? Do teaching styles have some influence on learning styles? The research does not adequately speak to this question. Although Kuchinskas (1979) and Coop and Liegel (1971) found some modifications in students' cognitive styles based on the cognitive style employed by the teacher.

Choice of teaching area seems to be somewhat dependent on personal learning style. Witkins (1977) reported that elementary teachers tended to be field dependent. They were socially oriented, needed more clearly defined goals, were responsive to diverse points of view and responded to others as to appropriate behavior. While secondary teachers of math and science tended toward field independence, they were more independent in decision making, were relatively impersonal, and more intrinsically motivated.

Our understanding of some of the elements of learning style might be enhanced at this point by assessing our own preferences for learning. A listing of approaches to assessment are listed in Appendix B. However, it you are inclined at this point to do a less formal assessment of your own learning style, such a assessment appears in Appendix A and you may wish to run through it at this point.

After completing the inventory you will find that if

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your cognitive profile lies more to the left than the right you are probably more left-brain oriented and vice versa. If your affective profile lies to the left you are probably more systematic, structured and organized. If the affective profile is to the right you would tend to be more flexible, group oriented, and creative. You should keep in mind this is an informal inventory and more complete analysis is possible through other instrumentation.

The point in doing this assessment is to find out more about ourselves. The more we know about our teaching and learning styles the more we can modify our approach depending on the circumstance at hand. Even though in certain circumstances the probability of student success can be increased (Marshak, 1979) it would be undesireable and unrealistic to match learners with teachers based on style all of the time. The more desireable option would be to encourage each student and teacher to flex their styles. The students flexing their styles will create a greater ability to learn under varying conditions and in different contexts. Joyce (1981) found this increased learning to learn ability and describes it this way: "Children who vary quite a bit in conceptual levels appear to be able to learn the processes of the different models of teaching so that they can achieve considerable levels of independence . . . (they) appear to be able to acquire a variety of strategies for teaching themselves in much the same manner that teachers can acquire a variety of methods for teaching (Joyce, 1981)."

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Brain Research and Learning Styles

The brain has an amazing capacity and as contrasted to physical containers, the more "put in" or learned, the more capacity it seems to develop. This remarkable organ changes and grows constantly. A wide range of environmental stimulation and experiences seem to optimize its development (Epstein, 1978). Education has been shown to physically alter the brain. Teyler (1978) conducted experiments in which subjects who were taught the scientific method actually had more dendritic branches in their brains than the control group.

Kohlberg (1975) concluded that cognitive development depended upon "higher level reasoning" presented to the learner in order to create the appropriate level of tension.

Many other elements of brain research related to learning styles have been discussed. Epstein (1978) discussed gender differences in cognition, Fox (1978) proposed integrating the hemispheres in teaching and learning to enhance development, Languis (1980) proposed providing experience prior to developing concepts in order to flex the learner, Epstein (1978) suggests age dependent variables related to hemispherical preference.

Wittrock's (1978) study summarizes the instructional implications of cognitive processes in the brain.

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1. Teachers should capitalize on students' past experiences which form the structure into which they can assimilate new learning.

2. Teachers should keep in mind that the same treatment may mean different things to different learners and different treatments may be unnecessary to obtain the same results with some learners.

3. Teacher expectations are extremely important elements in influencing student achievement.

4. Teachers need to be more aware of student motivation and "getting their attention."

Adapting Teaching

Since we have seen that learners possess different ways to learn and we already were aware of different abilities, it seems appropriate that we would want to enhance student learning by creating a broader context within which achievement would be maximized for the greatest number. Joyce (1981) and other researchers have suggested that teachers increase their repertoire of strategies in order to provide options for different types of learners. Following are some suggestions for recognizing different aspects of learners:

1. Use questions ranging from recall to making value judgements.

2. Provide a general overview of what is to be learned so that past experiences will be associated with new ideas.

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3. Allow sufficient time for information to be processed and then integrated.

4. Expect that at least one new thing will be learned by each student.

5. Set clear purposes for listening, viewing or reading experiences.

6. Use a participatory warm up before each lesson development.

7. Use spaced practice to help remembering and skills development and have practice include verbal and image rehersal.

8. Use multisensory means for both processing and retrieving information.

9. Use various review strategies to close a lesson.

10. Use descriptive feedback rather than simple praise.

Matching Teaching and Learning Styles

While it may seem at first glance that matching of students' learning styles with teachers instructional style is highly desireable, the issue is not as simple as it appears. One might expect that by matching styles students' learning would increase. However, the research in this area is mixed. For example, Walter Hunter (1980) reports that while certain teaching styles have a relationship to student grades, the matching of these styles do not appear to have a significant effect. Cotterell's (1982) review of twenty-three studies on matching, and achievement, found that seven failed to show any relationship and sixteen showed only moderate support for matching. The other major argument against matching styles is that students need to be exposed and adapt to different learning situations in order to enhance their own ability to learn. If we were to

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match students with teachers based on style we would be creating an artificial learning environment unlike what the student may encounter in a less controllable world outside the classroom.

If we were to match students and teachers styles, we would have to decide on what basis the match would be made. Would we match cognitive style, physiological style or affective style? Would we match to the groups composite style for a classroom or would we try to individually match? Would we match styles only based on difficulty of task? Would we match for all students or just selected groups? The list of questions continues.

The research does show some outcomes for matching styles. An increased level of satisfaction and mutual regard among students and teachers was reported from matching. (Kirby, 1979, Hunt, 1971, Colterell, 1982). Sarachs and Dayton (1980) reported that matching based on field dependence was found to be unrelated to achievement gains but that teachers field dependency was related to the teachers' comfort with student-centered instructional approaches.

The area of education in which matching styles may prove to be most beneficial is in remedial and developmental work. If matching styles leads to greater satisfaction and satisfaction to increased persistence, then the style match should be seriously considered. In order for students to move to higher levels of leaning they must be involved in learning. If matching styles will keep them involved, then a matching system should at least initially be used.

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Conclusion

Students' learnings may be enhanced and their level of achievement increased through changes in instruction, if these changes are not what's fashionable or "in" at the time. The changes must be within the ability of the teacher and coupled with a real willingness and desire to enhance student achievement. The changes must take into consideration how students learn, i.e., their learning style.

The above is not to suggest that students have no responsibility for their own learning because I think we all believe they do. It is to suggest that we may make some changes which will allow students a better opportunity to learn and to be more responsible for their own learning.

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