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Creating instructional strategies which match individual learning styles

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Abstract

Recent studies have begun to focus on matching instructional 3 strategies and learning styles. For example, the studies conducted by Biggs, Papalia, and Smith and Renzulli (cited in Curry, 1990) article has as their primary objective the study and application of learning styles to improve the immediate and long-term results of general teaching-learning processes. According to Guild (cited in Brandt, 1990) , the focal point of the learning style movement is that individuals are different, so one instructional strategy will not suit everyone. Teachers who have begun to explore the notion of learning styles agree that the concept gives them a better understanding of differences and of ways in which they can provide for those differences, thereby improving learning. However, others reject the notion as a fad or impractical (Guild, 1990).

CREATING INSTRUCTIONAL STRATEGIES

WHICH MATCH INDIVIDUAL LEARNING STYLES

A Graduate Project

Submitted to the

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UNIVERSITY OF NORTHERN IOWA

by

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Creating Instructional Strategies Which Match
Individual Learning Styles

Recent studies have begun to focus on matching instructional strategies and learning styles. For example, the studies conducted by Biggs, Papalia, and Smith and Renzulli (cited in Curry,1990) article has as their primary objective the study and application of learning styles to improve the immediate and long-term results of general teaching-learning processes. According to Guild (cited in Brandt, 1990) , the focal point of the learning style movement is that individuals are different, so one instructional strategy will not suit everyone. Teachers who have begun to explore the notion of learning styles agree that the concept gives them a better understanding of differences and of ways in which they can provide for those differences, thereby improving learning. However, others reject the notion as a fad or impractical (Guild, 1990).

Weston & Cranton (1989) suggest that the selection of teaching materials and methods which compliment the various learning styles of the learners may well be the most complex aspect of the instructional process. It is , however, the area that is least likely to receive adequate attention. Time and money often affect the decision. Educators often lack the time to prepare activities or locate the resources. In times of budget restraint, resources such as media equipment are frequently not readily available. Curriculum committees periodically review course and program objectives but they generally focus more on the evaluation of student learning than on the means by which the content is communicated. Without training and direction, educators tend to use the methods and materials with which they are most familiar (Cronbach & Snow, 1977).

In this paper the term "learning style" is used to describe personal characteristics of an individual expressed through the manner in which one processes information. The term "instructional strategy" refers to both the teaching materials and methods used in the teaching process.

Some administrators and teachers have attempted to design individualized programs for students which enhance their learning; many of these programs are based on research findings and a recognition of the individual's needs. Such programs and models have improved skills and changed behaviors for some , but not for all students. According to studies conducted by Pauk , Simon , and Entwistle and Ramsden (cited Pressley et. al,1989), effective strategy users generally find quiet settings for study, carefully schedule their lives for time to accomplish tasks, make choices about what resources to use and what to do first, decide whether to work in a group or alone, apply strategies across domains, attend to the demands placed on them, plan before acting, and relate current situations to previous encounters. Because they have these study habits, good strategy users usually benefit from the instructional programs offered to them by their teacher. Learning strategies are, however, frequently hampered because students fail to apply the good study habits mentioned above.

Although research has generally supported the existence of individual differences in student learning styles, researchers have recently greatly increased our awareness of the need to fit instruction to unique styles of learning (Cronbach & Snow, 1977; Good & Brophy, 1973). According to Keefe (1979), learning style diagnosis is one of the most powerful tools available to educators for analyzing, motivating, and assisting students in learning; it is truly the modern approach to education.

Models

Guild states in Brandt's (1990) article one of the things that makes the subject of learning styles so confusing is that there are so many competing models. Guild advises people to look at learning styles conceptually and focus on the key issues: (a) people are different, (b) learners will respond differently to a variety of instructional methods, and (c) teachers need to respect and honor individual differences among students.

Teachers should be encouraged to know at least two models of learning styles to offer to their students. Depending on the teacher's situation, one learning style may be more appropriate than another (Guild, 1990). Brief descriptions of some current models of learning styles, their differences, similarities, and learning activities preferred by each learning style are presented in this review of the literature on learning styles.

Kolb (1976), a leading learning style researcher, has developed an instrument to use in the assessment of learning styles. The emphasis in Kolb's model is placed on the need for teachers to be aware of personal learning styles and the available alternative modes of learning they might provide for their students. Knowledge of learning style differences should affect the design of instructional experiences and enrich individual strengths. Kolb's (1976) The Learning Style Inventory (LSI) proposes a four-mode cycle of learning: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). Each mode in the cycle requires learners to use different abilities. In development of this learning style inventory, Kolb hypothesized four types of learners. The diverger combines concrete experiences (CE) and reflective

observation (RO) to approach learning tasks. The assimilator learns best through abstract conceptualization (AC) and reflective observation (RO). The converger learns best when given suggestions which lead to the solution of specific problems through the use of abstract conceptualization (AC) and active experimentation (AE). The accommodator uses concrete experimentation (CE) and active experimentation (AE) to solve problems on an intuitive trial and error basis. The Kolb LSI is a 12-item, self-report, rank-order questionnaire containing twelve sets of words. Each item begins with a phrase such as "When I learn ..." or "I learn best from ..." and the respondents rank the sentence completions based on how they learn "through feelings" (CE), "by watching" (RO), "by thinking" (AC), or "by doing" (AE). Kolb provides no information on how to calculate scores on his four combinations of learner types, however, a learning style profile can be obtained. The activities each learning type typically engages in are as follows: Divergers enjoy brainstorming; they like "hook" questions, showing pictures, demonstrations, mind-maps, making logos, and imagery. Assimilators enjoy lectures, making charts, graphs, and time lines, viewing pictures and overheads, and using examples. Convergers like hands-on activities, worksheets, fact games, and puzzles; they like testing theories, reading, and drills. Accommodators like to draw, write stories, poems, and journals; they like to be involved in skits and plays. They like cartoons. They like to think of how to use things in real life experiences.

Rita Dunn, Kenneth Dunn, and Gary Price (hereafter referred to as Dunn), learning style researchers, have designed an instrument to assess learning styles. Dunn's Learning Style Inventory (1975) assesses the following four basic stimuli: environmental, sociological, emotional, and physical to which an individual responds uniquely and in varying amounts (Dunn, 1978). It is a 100-item,

true/false instrument from which a child-specific learning style profile can be obtained. A learning environment conducive to that style can be constructed to fit the learners' needs.

The Dunn's Learning Style Inventory was designed for grades three through twelve to analyze the conditions under which students prefer to learn. For example, students having a strong preference for environmental elements such as sound, light, temperature, and design may consider seating arrangements of a soft or hard chair; a brightly lit room or a dimly lit room; and a room with their preferred temperature and acoustical quality. Students with emotional elements (motivation, responsibility, persistence, and dependence on structure) may have a strong desire to learn because of parental pressure, grade consciousness, desire to please instructors, natural zeal for knowledge, or peer pressure.

Individuals affected by sociological elements (interaction preferences) may be self-sufficient enough to maximize their learning potential in an independent setting. Closeness of friends may also trigger learning for certain students. Students having a preference for physical elements (sensory orientations, optimal learning hours, eating habits, or mobility) enjoy taped programs, films, and games. The involvement of more of the five senses can also enhance the classroom atmosphere and reinforce what is being learned from the instructional material (Dunn, Dunn, & Price, 1975). These individuals may even crave food and drink, mobility, and change in the classroom.

Gregorc, another learning style researcher, has also designed a learning style model, The Gregorc Style Delineator (1982). Mediation theory postulates two dimensions of learning: perceiving and ordering of information. Strong emphasis is placed on the matching of instructional strategies and materials to individual

preferences. Preferences can range from concrete to abstract and sequential to random. Because individuals tend to prefer one aspect of each dimension, four styles can result. The styles are concrete-sequential (CS), concrete-random (CR), abstract-sequential (AS), and abstract- random (AR). A concrete-sequential style learner prefers direct hands-on experiences presented in a logical order. A concrete-random style learner prefers a trial and error approach and takes intuitive risks along the way. An abstract-sequential style learner prefers rational and sequential presentations. Abstract-random style learners prefer to receive information in an unstructured manner and to organize materials through reflection (Gregorc, 1982,1987). The Gregorc Style Delineator consists of ten sets of four words. The individual ranks the four words from the least to the most descriptive of themselves. These responses are scored from one to four respectively. The total score for each of the four subscales is the ranking of the ten word sets. The raw score for each subscale can range from ten to forty. Students representing the concrete-sequential learning style prefer workbooks or lab manuals, lectures accompanied with overhead transparencies, drawings, or models, demonstration teaching, hands-on materials, field trips, and programmed or computer instruction. Students with an abstract-sequential learning style prefer instructional phonograph records, audio tapes, extensive textbook reading assignments, slides, and lectures. Individuals with a concrete-random learning style prefer games or simulations, independent study projects, optional reading assignments, brief lectures, and problem solving activities. Students representing the abstract-random learning style prefer to listen to, learn from, and respond to their fellow classmates; participate in group discussions; observe gestures, listen for intonation, and reflect upon these in connection with the message being given (Gregorc, 1982).

Each of these learning style models advocates honoring diversity among individuals and shows that educators adapt instruction to the ways in which individuals learn. The three models presented have a great deal of history and research behind them (Dunn, 1990).

Research on learning styles

Many educators and administrators ask "Does teaching through specific learning styles significantly increase academic achievement?" Perhaps, some insights based on learning style research can help in answering this question.

The key problems with the research done to date is that (a) the definitions of learning styles are not clear or commonly agreed upon, (b) instruments used to assess learning styles have not been thoroughly tested, and (c) no clear cut evidence has been found to indicate which instructional practice meets the needs of which specific learning style. However, the tendency of many learning style researchers has been to rush too soon into print before completing the essential pattern of hypothesis-investigation- modification. They have marketed early and used preliminary indications of factor loadings based on one dataset. This haste seems to weaken any claim of validity from test scores (Curry, 1990). While some researchers report great success when matching teaching strategies to learning styles, others report no significant differences.

Curry (1990) suggests researchers have not been able to conclude whether significant results are achieved when learners are matched or mismatched to instructional and/or curriculum methods. However, according to Witkin et al. (cited in Curry ,1990), the matching of students with teachers or instructional materials

based on their cognitive style might promote the students' acquisition of skills, thereby increasing motivation. According to Cafferty (cited in Dunn, 1983), the greater the match between student's learning style and the teacher's instructional style, the higher the achievement rate. Children taught through their strongest learning style preferences learned more easily and retained the information more easily (Carbo, 1980).

Students who preferred bright light performed statistically significantly better when tested in brightly lit areas; they tested best in matched situations as opposed to mismatched situations states Krimsky (cited in Dunn, 1983). Pizzo (cited in Dunn, 1983), also found that when students were matched with their learning style preferences, statistically significant higher achievement rates resulted. Trautman (as cited in Dunn,1983) reported that whenever instructional materials were matched correctly to the students' learning style, statistically significantly academic gains were made.

According to Guild as stated in Brandt's (1990) article some approaches for accommodating learning styles can bring about significant achievement gains, impact school climate and staff , as well as, increase student morale. Although not all research studies have shown that the matching of instructional strategies to a students' learning style can have a positive impact on the students' initial learning effort (cited in Smith and Renzulli, 1984), many researchers have reported data which they claim confirms that students learn best when the instruction in the classroom is varied so that it fits their personal learning style (Smith, 1976; Jones, 1971; Thelen, 1967; Pascal, 1971; James, 1962; and Torrance, 1965).

Guild (cited in Brandt, 1990) suggests that educators should know that learning styles exist and can be applied to all areas of education curriculum and instruction, leadership, staff development; and counseling. Theories and models can be applied in different ways and give insights about the types of learners we have in schools and about which learners traditionally perform better than others. Teachers and administrators are beginning to have a clearer understanding about the differences between learning styles and intelligence noting that people who possess different styles can be equally intelligent. Also, a better understanding about the nurturing relationship of culture and style enables educators to recognize the many diverse cultural styles and values that do impact a learner's style.

How flexible and versatile must a student be in order to be an effective learner? Shipman and Shipman as stated in Curry's (1990) article suggest that students in a complex changing society with diverse environmental factors need to become sensitive to and proficient in many alternative strategies. Snow and Lohman suggest in Curry's (1990) article matching student to instructional materials during the initial stages of learning, then moving to systematic mismatches as the student becomes more proficient with the material.

In Curry's (1990) article Kirby and Pask conclude that the absence of any identified style or style-like consistency in approach is the best learning style for understanding instruction. Both Kirby and Pask, (cited in Curry, 1990) advocate that learners take a flexible approach to instruction, one that can easily be modified as more cues become available about the learning conditions. Kirby refers to this as a synthetic style; Pask calls it a versatile style. A laudable goal for each student would, therefore, be to develop flexibility in dealing with all sorts of learning situations. However, the question remains: "Do learning style considerations help students develop this flexibility in any way?" (Curry, 1990).

Applying learning research to the classroom

Learning styles focus on student strengths rather than weaknesses. Our job as teachers is, therefore, to find other legitimate ways of teaching and learning something (Guild, 1990). When selecting the most appropriate instructional strategy, educators must keep in mind that, depending on the subject area and the level of instruction, any one method may or may not be the most effective. Even within one class, individual students may respond in different ways to the same teaching method because of their individual learning style. This implies that teachers should be prepared to use alternate teaching methods in order to teach the whole child and/or the whole class.

Teachers often try to remediate students' problems without looking at their strengths (Guild, 1990). As a sign of efficacy in the classrooms, therefore, teachers must try more effective ways of reaching and teaching all students. As a result of these efforts, teachers should see a renewal of positive attitudes in both themselves and their students, an increase in the number of options available to learners, and a renewed interest in using different approaches to teaching. Too often teachers have taught in a way that is simply a reflection of how they were taught or in way that is most comfortable to them (Gregorc, 1982, 1987).

Teachers, administrators, and parents must come to the realization that the present way of teaching (i.e., teaching without any attempt to meet individual learning style needs) systematically excludes certain students. The special needs of learning disabled, special education, and culturally diverse students are the most likely to be ignored by the traditional way of teaching because many teachers fail to teach the students in sociological patterns in which the students feel comfortable (Dunn, 1990).

Teaching methods, techniques used for teacher-student interaction, can be described in at least four categories: (a) experiential, (b) individualized, (c) instructor-centered, and (d) interactive. Experiential learning techniques involve having the student perform in a " real life" setting. Generally, the student is given a specific task to perform under the supervision of the instructor. Role play is commonly used in situations that allow students to "act out" a particular situation practicing the skills to be mastered. In laboratory settings, students are actually involved in a realistic setting that is carefully planned and evaluated by the teacher. Experiential methods can take the form of instructor-centered, interactive, or individualized. Games and simulations can provide practice in specific skills to be mastered and allow the student to experience the anxiety and the active participation of a real life situation. Drill is often appropriate at lower levels of learning; it provides active participation and should be repeated as many times as needed for mastery (McCollough & Van Atta, 1958; Faw, 1949). Because students learn at different rates, and because regular immediate feedback facilitates learning, individualized learning methods should be sought and used. In individualized learning settings, students work directly with prepared materials at their own pace, receiving information that enhances their progress at regular intervals. In programmed instruction , for example, the content of a specific lesson is broken down into a sequence of steps for students who proceed at a different rate.

The teacher is primarily responsible for conveying information to students in the instructor-centered method. In this method, the instructor communicates to the students in a one-way, one-sided lecture; the most familiar of these methods is the one in which the teacher speaks directly to a group of students. Although this

method is efficient and effective, students are passive rather than active in the learning process. Questioning, another instructor-centered method involves direction of verbal questions by the teacher to individual students or to the entire class, in hopes of getting clarifying responses.

In using demonstrations, teachers illustrate the concept or skill. The students observe the process.

Interactive methods involve communication among students, as well as , between students and instructor. In these methods, learning is facilitated by the active participation of students in a discussion. Class discussions, the most commonly used method, provides a topic, issue, or question of interest so that the students can communicate/discuss their viewpoints or relevant arguments with each other. Small group discussions can be used in place of whole class discussions when the group size is too large, when students' interests vary, or when students prefer small group interaction. Both small group discussions and whole class discussions can effectively facilitate learning (Asch,1951; Faw, 1949; McCollough & Van Atta, 1958; and McKeachie, 1978).

When students' interests are similar and when there is a likelihood that students will gain from peer interaction, group projects can be used. In this way, students who have mastered the objective can play that they are the teacher and teach the information or skill to students who have not yet mastered it. Students are actively involved in the teaching and learning processes when this method is used. Instructional materials such as handouts, overhead transparencies, and real objects are the resources often used to communicate information.

There are three components of instructional materials: (a) delivery system, (b) message, and (c) form or condition of abstractness. Textbooks, slides, handouts,

transparencies, or computer assisted instruction (CAI) are examples of a delivery system. Information that is conveyed with teaching materials is the content or message; a textbook article about art, a slide presentation about ways of making a media production, or a videotape about the greenhouse effect are examples of common instructional materials states Torkelson (cited in Cranton & Weston ,1986).

The most important consideration when selecting instructional materials is the form or message; consideration of all three components of instructional materials is, however, useful for many reasons. The form or message can be thought of as occurring on a continuum from concrete (real things) to abstract (symbols). It emphasizes that one must consider not only the content or message that will be presented but also the form in which it will be presented and the wide range of materials from which one can choose when designing instruction.

When deciding which methods and materials to use for instruction such variables as physical facilities, class size, the subject area, the availability of resources and materials, and general student characteristics must be considered. For example, having a visually impaired student in a class would obviously lead the teacher to provide alternative (eg., audio) materials; the presence of a student in a wheelchair would hamper the extensive use of active simulations or games. A classroom without movable desks or chairs would not easily allow for organizing group discussions.

In matching the methods and materials to the learning task, educators must also become aware of the students' prior knowledge, and any special needs of the students (Dale, 1969; Torkelson, 1975). It is important to know what prior knowledge about the specific subject area a student already has.
For example, a student must know the basic colors before attempting to categorize them into primary or secondary colors.

Summary

The literature clearly supports the notion that differences in student learning styles do in fact exist and appropriate instructional strategies to improve student learning in each area of the learning process also exist. Educators must, however, become flexible enough to incorporate appropriate strategies. They must also help learners recognize how they process information and assist them in developing alternative cognitive styles of learning. Research findings show that learning style matching can and does have a positive impact on student learning. No one learning style is better or worse than another. It is noted that there is a great need for continued research on this subject (Cafferty,1980; Thelen, 1967; Smith, 1971; Torrance, 1965; Carbo, 1980; Krimsky, 1982; and Pizzo, 1981).

Much of the learning style research conducted in the past ten years has, however, been short-termed and focused on particular age and element of learning style. More long-term research is needed (Guild, 1990).

In the future, learning styles will continue to be an issue when we rethink education. They will help us find ways to value diversity, set uniform objectives,but still honor individual differences. Also, learning styles education will give us direction for changing schools and help us find ways for every student to be successful (Guild, 1990).

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