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Essential learner characteristics in instructional design

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Essential learner characteristics in instructional design

Abstract

"The role of the professional educator is to be familiar with those factors affecting learning and to design educational experiences that maximize the learning that occurs" (Armstrong, 1987, p. 157). If professional educators want learners to gain the most from education, they must consider those factors affecting learners' learning. For example, as noted by Kemp (1985), suppose that you had never known the design of instruction, and you begin your lecture at the first class meeting of your course. You have put a lot of work into developing the beginning unit in order to influence students with the value of the subject. Detailed statistical content from recent research and complex explanations are contained in your lecture. As you continue, you sense response: a few students are listening seriously and rapidly taking notes; other students appear puzzled; and some students look thoroughly indifferent. It is the only opportunity for all of them know this important information! Is there anything wrong? It may be that in your groundwork, you have paid little attention to the nature of the learners, learners' aptitudes and preparation levels, learners' degree of motivation, or other learners' characteristics which related to interest and success in learning.

Essential Learner Characteristics
in Instructional Design

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by

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CHAPTER 1

Introduction

Introduction to the Problem

"The role of the professional educator is to be familiar with those factors affecting learning and to design educational experiences that maximize the learning that occurs" (Armstrong, 1987, p. 157). If professional educators want learners to gain the most from education, they must consider those factors affecting learners' learning. For example, as noted by Kemp (1985), suppose that you had never known the design of instruction, and you begin your lecture at the first class meeting of your course. You have put a lot of work into developing the beginning unit in order to influence students with the value of the subject. Detailed statistical content from recent research and complex explanations are contained in your lecture. As you continue, you sense response: a few students are listening seriously and rapidly taking notes; other students appear puzzled; and some students look thoroughly indifferent. It is the only opportunity for all of them know this important information! Is there

anything wrong? It may be that in your groundwork, you have paid little attention to the nature of the learners, learners' aptitudes and preparation levels, learners' degree of motivation, or other learners' characteristics which related to interest and success in learning.

Learner Characteristics

One of the least understood and most complicated elements of any educational system is its students (Bass & Hand, 1978). Learner characteristics are a broad field, which can contain everything from home environment, to attitudes toward school, to cognitive styles (Dick & Carey, 1990). Dick and Carey point out that we all pay attention to our own characteristics, such as our preference for written instruction over lectures, and we instinctively believe that individual differences among learners are important. It is well known that people differ in many respects, including the way in which people learn (Kemp, 1985).

As suggested by Snow (1986), individual differences among learners demonstrate a widespread and significant problem to educators. Snow points out:

At the outset of instruction in any topic, students of any age and in any culture will differ from one another in various intellectual and psychomotor abilities and skills, in both general and specialized prior knowledge, in interests and motives, and in personal styles of thought and work during learning. These differences, in turn, appear directly related to differences in the students' learning progress. These relations imply individual predispositions that somehow condition students' readiness to profit from the particular instructional environment provided (p. 1029).

Furthermore, as noted by Kemp (1985), learner populations consist of many types of people, e.g., from elementary levels through high school and college, and in training areas whether industrial, business, health, government, or military. Therefore, it is necessary to pay attention to the learner characteristics, abilities, and experiences early in planning (Kemp, 1985).

Learner Characteristics and Instructional development

To facilitate either an academic class or a training group, information about the capabilities, needs, and interests of the learners is essential for the instructional planner (Kemp, 1985). Certain elements in planning are influenced by this information, such as the choice of topics, the selection and succession of objectives, the extent of topic treatment, and the type of learning activities (Kemp, 1985). Thiaharajan (1976) stated that all stages of the systematic instructional development process are influenced by the analysis of the learner.

There are six points of how instructional activities are influenced by information about learners (Thiaharajan, 1976). First, when and where task analysis should terminate are decided by the entry level of the learners. Second, the most valid method for testing learner achievement of the instructional objectives is decided by learners' competencies. Third, the media and format for instruction are decided by learner preferences. Fourth, where instruction should begin is decided by the entry level of the learners. Fifth, the complexity and style of language

used for instruction are decided by the level and preferences of the learners. Sixth, the choice of examples for teaching and testing is decided by previous experiences of the learners.

As noted by Dick and Carey (1990), overestimating or underestimating the ability of learners is still a great problem. Most instructional designers are far removed either by age, expertise, or socioeconomic status from the students whom they hope will utilize the materials. Therefore, to design effective instruction, the characteristics of students must be recognized by the designer. Moreover, Dick and Carey point out that it is critical that the characteristics of the target population be considered by instructors.

Elements of the Instructional Development Procedure

The framework of the instructional development procedures is formed by four elements: learners, objectives, methods, and evaluation (Kemp & Smellie, 1989). As noted by Kemp (1985), one of the important elements of the design process of instruction was to consider the students for whom instruction is being prepared. The measure of success of an instructional

plan will be based mainly on the learning level performed by the students included (Kemp, 1985).

Dick and Carey (1990) point out that there is a basic question which must be answered: is specific content being taught or is the target population being taught? If the intention is to teach a specific target population, then the instruction must be adjusted to correspond to entry behaviors. Moreover, Dick and Carey point out that in order to have effective instructional materials or, for that matter, any type of successful instructional experience, learners and instruction must match. For example, if instructional materials depend heavily upon the reading ability of learners, then students must have a minimal level of reading ability in order to read the materials (Dick & Carey, 1990).

Statement of Purpose

The purpose of this study is to review literature related to the learner characteristics essential for the design of instruction.

Research Question

The following question will be examined:

What learner characteristics are essential for the design of instruction?

Definitions

1. Instructional design: " The term instructional design refers to the systematic process of translating principles of learning and instruction into plans for instructional materials and activities" (Smith & Ragag, 1993, p. 2).
2. Entry behaviors: " Specific competencies or skills a learner must have mastered before entering a given instructional activity." (Dick & Carey, 1990, p. 310)
3. Locus of control: " Locus is a personality variable associated with an individual's perception of the source of major life influences and is frequently associated with "style" variables".

Locus of control can also be considered a psychosocial trait. (Smith & Ragan, 1993, p. 48,49)

4. Group-based instruction: " The use of learning activities and materials designed to be used in a collective fashion with a group of learners;

interactive, group-paced instruction "(Dick & Carey,
1990, p. 310).

CHAPTER 2

Review of Literature

Smith and Ragan (1993) write, "depending upon the instructional task, some learner characteristics may be more critical than others" (p. 55). For example, physiological characteristics may be very significant for geriatric viewers but of little significance for general public school viewers. For planning an individual design project, it is doubtful that all factors will be involved in the learner analysis (Smith & Ragan, 1993).

However, some learner characteristics are suggested to be essential when designing instructional plans. Key learner characteristics may need to be considered when designing instructional plans. Dick and Carey (1990) point out that entry behavior is a key component in the design process. In addition to entry behavior, personal and social characteristics, characteristics of nonconventional learners, learning conditions, cognitive styles are learner characteristics needed to be given attention when designing an instructional plan (Kemp, 1985).

Moreover, as pointed out by Smith and Ragan (1993), three personality characteristics, including trait anxiety, trait locus of control, and academic self-concept are not the only personality constructs that we could consider; however, all three are specially useful for the instructional designer to employ.

In this chapter, learner characteristics, suggested to consider when designing instructional plans, will be discussed.

Entry Behavior

As explained by Dick and Carey (1990), one job of the instructional designer in the design procedure is to know the entry behaviors or skills that must be demonstrated by students from the target population before starting instruction. Furthermore, Dick and Carry (1990) point out that entry behaviors are not simply a catalog of things that these learners understand or can do, but those skills required to start instruction.

Why are entry behaviors so critical? As suggested by Dick and Carey (1990), entry behaviors are interpreted as the skills that fall directly below the

skills instructors prepare to teach. Therefore, they are the first obstacles for instruction. Given these skills, students can start to obtain the skills demonstrated in instruction. Without these skills, a student will have a very hard time attempting to learn from instruction. Entry behaviors are one important element in the design procedure.

In addition, Dick and Carey (1990) point out that while encouraging students and employing demonstration formats that they enjoy are critical, the factor that has demonstrated prediction of success in an instructional situation is a student's former knowledge of the content area. Psychologists often suggest to designers that the extent and the context of the knowledge learners already have about a certain topic is important. This information can then be employed to decide how to connect the new knowledge to be mastered with that which students have learned.

Personal and Social Characteristics

As noted by Kemp (1985), it is desirable to be conscious of personal and social characteristics of the student for whom the instruction is to be designed. To

plan a process for teaching a student, an instructor needs the following knowledge about the learner: age and maturity level, motivation and attitude toward the subject, expectations and vocational aspirations, previous or current employment and work experience, special talents, mechanical dexterity, ability to work under various environmental conditions-noise, outdoors during inclement weather, high elevations, and so on (Kemp, 1985, p.47). Furthermore, subject-matter competence also needs to be considered (Thiagarajan, 1976). In addition, if a notable percentage of the student population is included by special groups, social characteristics peculiar to each group should be paid due attention (Kemp, 1985).

Characteristics of Nonconventional Learners

As stated by Kemp (1985), "... attention also should be given to the special characteristics of those individuals termed here nonconventional learners, whose preparation, behavior, and expectations may not be conventional" (p.47). Ethnic minority learners, disabled learners, and adult learners are included in these groups.

Ethnic Minority Learners

As noted by Santa Cruz (1982), "the minority learners are unique in some ways, ways which have implications for the design of instruction" (p.28). Moreover, Kemp (1985) points out that ethnic minority learners may include members of cultures with backgrounds and behaviors that differ obviously from those of the majority of learners or trainees. Therefore, attention should be given to their special characteristics during designing instruction. As noted by Santa Cruz (1982), it is hard to adjust training for different cultural groups without data about the values and norms of those groups.

Kemp (1985) states that one apparent concern of ethnic minority learners may be inadequate skill in the instructional language. Furthermore, Kemp (1985) points out that cultural and social differences should be realized because such things as the ability to take responsibility for individualized work or to employ creative activities can be influenced by them.

In order to construct confidence in their ability to accomplish learning tasks, persons from minority cultural groups may require more than ordinary teaching

procedures. Such attention can be crucial whether the students are in an academic or a vocational training program (Kemp, 1985).

Disabled Learners

The classification of disabled learners consists of physically handicapped persons and others with learning disabilities (Kemp, 1985). Each type of handicapped learner has different limitations and needs special attention. While some physically handicapped individuals can join common classes, others cannot. Moreover, Kemp (1985) points out that special training and individual attention are needed by some handicapped learners. Therefore, an instructional program may require extensive modification in order to help handicapped learners.

Adult learners

An important factor lessening the homogeneity of learner populations is the expanding number of adults who have become students. Returning to colleges and universities, participating in community adult education programs, and engaging in job training or

retraining for new skills in business, industry, health fields, government service, and the military are among the examples of where to find adult learners (Kemp, 1985).

A number of generalizations about instructing adults have been identified (Kemp, 1985). As stated by Kemp (1985), first of all, adults participate in a program with a high level of motivation and readiness to learn. Second, adults convey to a course considerable background experience from both their personal and professional lives. Third, when compared with younger learners, adults may be less flexible. Adults' habits and methods of operation have been formed into a routine. Fourth, adults want to be considered as adults. Fifth, most of adults are largely self-steered and self-governing. Moreover, Manteuffel (1982) suggested that efficient usage of time is critically important to adult learners. Optimal learning performance is more likely when learners can progress at their own pace and are not stressed to progress at a pace set by others.

Learning Styles (Learning Conditions)

Many environmental factors in the classroom or study area can affect a person's ability to concentrate and to absorb and retain information. Therefore, how each person responds to sound, as one factor in the learning environment, may be an important consideration for that person's successful learning (Kemp, 1985).

Carbo, Dunn, and Dunn (1986) stated that everybody has a learning style, but everyone's is different. They also suggest that learning style is a way that students of every age are influenced by their (a) immediate environment, (b) own emotionality, (c) sociological needs, (d) physical characteristics, and (e) psychological inclinations when focusing and trying to learn and remember new or difficult information or skills.

Learning style is a biologically and developmentally imposed set of personal characteristics that make the same teaching method useful for some and useless for others (Dunn, Beaudry, & Klavas, 1989). Children learn best only when they use their learning style characteristics beneficially; otherwise they

learn, but often forget what they tried to study (Carbo, Dunn, & Dunn, 1986).

The extent to which classrooms appear either to encourage or to constrain learning for learners with preferred learning style characteristics has been documented in terms of individuals' requirements for quiet versus sound, bright or soft lighting, warm or cool temperatures and formal versus informal seating designs (Dunn et al., 1989). For example, the need for sound continues fairly constant during the elementary school years but increases as adolescence starts and, as that stage proceeds, appears to return to its formerly normal level (Dunn et al., 1989).

Individuals diverge in their perception to light because of the differences in their biological makeup (Carbo et al., 1986). The older children are, the more light they need; but about every five years most children need significantly more light (Dunn et al., 1989).

Most people mention that they can not conduct their best thinking when they are either "too warm" or "too cool." Temperature is relative; people do not respond identically to the same amount of heat (Carbo

et al., 1986). If it is true that physical discomfort interrupts one's ability to concentrate, then it is understandable that children will not concentrate on reading when they are physically ill at ease (Carbo et al., 1986).

Learners who are able to sit for a long period still at a traditional desk and seat are physically capable of being seated for long periods in a formal design; those who choose learning in a bed or on a lounge chair, a couch, the floor or carpeting, do better in "informal" designs (Carbo et al., 1986). Furthermore, boys tend to need more mobility than girls and thus, find sitting for any length of time inconvenient (Dunn et al., 1989).

Students' responses to sound, light, temperature and design are beyond their control and will continue to be fairly constant over time if those elements are very critical to them. Environmental learning style characteristics can alter, and they often do, but when they are strong, they alter only slightly and over a period of time that is seldom fewer than two years and often is more than three or four years. How quickly the characteristic alters depends on how strong it is

and the learner's age (Carbo et al., 1986).

Whereas the environmental elements of learning style fundamentally are biological in nature, the emotional elements appear to be basically developmental. They appear over time as a growth of the experiences learners have at home, in school, on the playground, on trips etc. (Carbo et al., 1986).

Motivation connects with achievement. When students cannot learn, they often turn off, tune out, or withdraw (Carbo et al., 1986). Furthermore, motivation can be altered. "Unmotivated" students become willing to learn when they are instructed through their individual learning styles, provided material on their class and in small sequence, encouraged and given many opportunities to achieve, provided instant feedback, and led during the learning procedure (Carbo et al., 1986).

Persistence as an element, is different from other elements of learning style. First, every time learners with high IQ's who perform well academically are tested, learners are highly persistent (Carbo et al., 1986). Thus, persistence is the only element that agreeably associates with IQ. Second, although learners

do appear to become increasingly persistent as they are better able to reach their goals, it is a characteristic that tends to alter slowly; children without persistence may become increasingly encouraged and able to study more, but they continue to require frequent "breaks" and appear to have a short concentration span when involved in academic study. They have a long concentration span when involved with things that are interesting to them (Carbo et al., 1986).

Responsible learners usually try to do the things their instructors ask, but the opposite is not necessarily true (Carbo, et al., 1986). As noted by Carbo et al. (1986), one prize-winning study showed a strong relationship between responsibility, as evaluated by the Learning Style Inventory (LSI), and achievement via conformity on the California Psychological Inventory (CPI). Some learners prefer to be told precisely what to do, how to do it, when it is due, etc.; they then continue to obey those commands and feel good about doing so. Some children, however, are nonconformists; often they will do entirely the reverse of what their instructors or parents suggest.

Such children may be responsible, but they find it difficult to obey commands agreeably. Some people like to know precisely what is required of them before they start a project; others want only the goal and choose doing it their way; the latter group requires opportunities for creativity and exploration (Carbo et al., 1986).

The older learners become, the less structure they require (Carbo et al., 1986). Some learners of any age need a great deal of structure; they require assurance and work well with it. Some learners of any age are extremely self-structured and when more external structure is forced upon them, they feel it suffocating (Carbo et al., 1986).

The effect of learners' social preferences also influences their achievement in school (Dunn, Beaudry, & Klavas, 1989). Appointing children to study with others can be very improper in some cases and the best possible approach for others. Recognizing with whom a learner can work is very critical when attempting to teach children through their personal learning styles (Carbo, Dunn & Dunn, 1986).

Adults and children are alike in their sociological preferences. Some like to study alone; some can't learn with others. Some choose to study with others; when alone they can't concentrate on the critical items. With whom a learner studies is not critical; what is critical is that he/she does study (Carbo et al., 1986).

Authoritarian personalities, structure, orders, detailed exercises and mandated expectations are preferred by some children. Other learners react only to collegial, flexible teachers who give alternatives, self-started and paced curriculum projects, and friendship in the learning procedure. A mismatch of learner preference and instructor style in this regard usually generates learning problems, lessened motivation, and antipathy for school (Carbo et al., 1986).

Like the environmental elements of learning style, the physical elements are biological in nature (Carbo et al., 1986). Physical elements exist because of the way human beings' eyes, ears, nose, skin and bodies, in general, are. If how a person learns is strongly influenced by physical elements, they will continue

fairly constant over a period of time. They can alter, but they alter gradually. How slowly or rapidly change happens depends upon the physical maturation of the individual (Carbo et al., 1986).

Sensory preferences affect the ways in which learners learn (Dunn et al., 1989). Eight studies within the past decade suggest that "when youngsters were taught with instructional resources that both matched and mismatched their preferred modalities, they achieved statistically higher test scores in modality-matched, rather than mismatched, treatments" (Dunn, Beaudry, & Klavas, 1989, p.52).

Human beings learn through different senses. About 20 to 30 percent of the school-aged learners retain what is heard; 40 percent remember well visually what are seen or read; many people must write or use their fingers in some operative way to help them retain basic facts; information or skills cannot be internalized by other people unless these people operate them in real-life actions such as really writing a letter to learn the accurate letter format (Carbo et al., 1986).

"An auditory learner is one who recalls at least 75 percent of what is discussed or heard in a normal 40 to 45 minute period. The younger children are, the less likely they are to be auditory" (Carbo et al., 1986, p.13). Auditory learners retain what they hear and can recreate what they heard by focusing on former discussions or lectures. They save spoken words in their brains and can play them back at will when focusing and encouraged. This talent is a physical gift; it may develop with training and endeavor, but only if the sense of hearing is adequately well-evolved physiologically (Carbo et al., 1986).

Visual learners retain what they see and can fetch details and events by focusing on what they have seen. It is only recently that studies suggest that left hemisphere referenced people tend to retain words; right hemisphere referenced people remember pictures (Carbo et al., 1986).

Learners who use their fingers and hands while focusing usually are tactual learners. Tactual learners retain more easily when they write, doodle, draw, or move their fingers and hands. Often they do inventive things well with their hands and fingers such

as sewing, baking, repairing, designing, painting or molding (Carbo et al., 1986).

As suggested by Carbo et al. (1986), "young children, and those who seem to have problems in conventional classroom, often are kinesthetic learners" (p.15). These are children whose perceptual strengths appear to develop more slowly than those of average youngsters; thus, they can not retain a great deal of what they are instructed and require constant reminders; they often can't retain too much of what they are presented, and appear unable to remember particulars; and they learn most easily by a association of tactual and kinesthetic experiences (Carbo et al., 1986).

Many students relate to the need for eating when they learn or concentrate. Physicians propose reasons why some people require to eat, chew, drink, bite, lick, smoke, or in some way eat while they are employed in new or difficult cognitive endeavors. Some may exhaust their physical energy and try to refill the supply that is being decreased as they focus. Others become nervous or tense while attempting to study and want a cigarette or gum; they may be pursuing comfort

from their anxiety. Those who are bored with what they are doing seek to reenergize themselves with a reward "break" for a stimulus. Whatever the reason, some learners of all ages involve themselves in eating or drinking as they learn (Carbo et al., 1986).

Learning at the appropriate time can improve reading accomplishment. Many administrators insist that reading and math be instructed early in the morning when, they believe, children are most watchful. However, studies of learners throughout the grades and over a seven-year period show that at any time of day, at least one-fourth of the learner population is undergoing an energy low (Carbo et al., 1986). Dropouts, underachievers,, and at-risk learners are usually not morning people (Dunn et al., 1989). One element of learning style is the requirement for physical motion (Dunn et al., 1989). Children's willingness, abilities, interests and energy levels often relate directly to their mobility requirements. Adults have similar patterns (Carbo et al., 1986).

Carbo et al. (1986) point out that because children's persistence levels are different, some can work for long period of time continuously, others

require recurrent opportunities to relax and then come back to their studies, and others vary in their period of attention based on how critical persistence, design and mobility are to them. They also point out that the more negative notice children receive, the more difficult it is for them avoid moving. Observing their learning style may give a critical hint to why some children cannot sit still.

Analytic people piece particulars together to develop an understanding which is the reverse of the way global people learn. Global people need a general understanding first, and then they can concentrate on the particulars. Each group is as brilliant and as competent as the other, and, indeed, each group learns identically as well when instructed through resources and strategies that address the particular (Carbo et al., 1986).

Studies of both split brain patients and normal people have supported that the two sides of the brain play different functions; characteristically, one side of brain has a higher arousal level than the other. It is believed that the differences generated by either the right or left side's higher arousal reactions may

be related to cognitive and personality function (Carbo et al., 1986). Those differences in human brain functioning partially are what generate individual learning style differences among people; they imply that learning is better achieved for different people through different accesses (Carbo et al., 1986).

Studies of the differences between learners who demonstrate extraordinary left or right hemisphere preference showed that they mastered the learning task very differently (Carbo et al., 1986). Obviously right and left brain dominant learners have different environmental and organizational requirements when concentrating as well as different motivational and personality characteristics. Right and left brain dominant learners learn equally as well--but differently (Carbo et al., 1986).

Traditional instructors find it difficult to accept impulsive children--those who become effervescent and call out, act impulsively, and perform before they think. Conversely, reflective learners are judged more thoughtful--maybe because they usually act thoughtfully and appear more sensitive to controls. However, often the one characteristic is judged to be

positive and the other negative--which is a faulty perspective. Both qualities are useful when used at proper times. When the learner has both characteristics and perceives when and how to employ them effectively, he is probably at an advantage (Carbo et al., 1986).

Cognitive Styles

In addition to Dunn and Dunn's learning styles, another aspect to analyzing the considerations which influence how a person is most likely to learn is by cognitive style mapping. The initial work in this area was performed by Joseph Hill (Kemp, 1985). This method gives a framework for describing and diagnosing an individual's way of searching for meaning when faced with a certain educational task (Kemp, 1985).

Cognitive style is the unique way in which an individual searches for meaning. It is reflected in the way: (a) qualitative and theoretical symbols are handled; (b) cultural influences affect the meaning given to symbols; and (c) meaning is derived from symbols that are perceived " (Dunn, DeBello, Brennan, Krinsky, & Murrain, 1981, p.375).

The theoretical construct of educational cognitive style is formed of the following four sciences: symbols and their meanings, cultural determinants, modalities of inference, and electrophysiological and biochemical aspects of memory function. For realistic purposes, however, only three of these sciences are currently being employed in the design of instruction (Bass & Hand, 1978).

Symbols and their meanings is a field in which learners are considered as to their abilities to employ both the theoretical and qualitative symbols (Bass & Hand, 1978). "Theoretical symbols are those having to do with written or spoken words or numbers and qualitative symbols are those having to do with the senses and feelings, commitments, and values" (Bass & Hand, 1978, p.102).

Theoretical symbols are employed in ordinary language to convey ideas in a associated, continuous manner according to the laws of common logic. Qualitative symbols are employed to communicate feelings, commitments and values, and to give certain types of insight into the domain of self (Bass & Hand, 1978).

Cultural Determinants is a field in which the choices and predispositions of learners toward ways of working and ways of making decisions are considered. Do they choose or are they predisposed to work or make decisions in combination with their associates (A), in combination with their families or authority figures (F), or independently (I)? (Bass & Hand, 1978).

Modalities of Inference is an field in which learners are considered concerning how they choose to process and combine new information into their cognitive structure. Are they categorical thinkers who are assisted vastly by definitions, regulations, or step-by-step procedures (M)? Are they most comfortable with sharp 1-to-1 comparisons, or information which reports them how new information differs from what they already perceive (D)? Are they most comfortable with information which relates new information to what they already perceive (Multiple relationships) (R)? Or, are they most comfortable with a association of these gathering as much data as possible about a circumstance before a decision is made (L)? (Bass & Hand, 1978).

The way students take notice of their total environment decides their cognitive style--how they

becomes informed (Hill & Nunney, 1971). Are they involved only with their own point of view or are they convinced in making decision by their family or by their group associates? Do they deliberate more like mathematician or social scientists or fishermen (Hill & Nunney, 1971)? Family background, talent, life experiences and personal aims make each of us different. The certain way that each of us perceives our world and reacts to it is our cognitive style (Hill & Nunney, 1971). Hill believes that the cognitive style of an individual can be changed by the process of training and education (Martens, 1975).

"Only about a third of the nation's students really master the skills and concepts presented to them in school, but ninety-five percent are capable of doing so" (Hill & Nunney, 1971, p.1). Hill and Nunney (1971) point out that a method to alter this circumstance is to stop employing individual differences as a means of deciding who does well or who fails in group competition, and instead, accommodate to differences in cognitive styles as a means of changing teaching methods to guarantee the individual's success in his educational program.

Bass and Hand (1978) point out that of the methods currently available for measuring individual differences and employing the data in the design of instruction, educational cognitive style is the area of highest importance. Bass and Hand (1978) also point out that educational cognitive style gives an outline of the individual learner's strength and weakness which might influence his/her education, an outline showing how he comes to perceive. This expansion in valuable data, as to the individual differences of learners, provides a much better chance for the proper design of instruction.

Psychosocial Traits

As pointed out by Smith and Ragan (1993), three personality characteristics, trait anxiety, trait locus of control, and academic self-concept are not the only personality constructs that could be considered; however, all three are specially useful for the instructional designer to employ.

"A trait characteristics is a characteristic that tends to be stable over time in contrast with a related characteristic that is changing" (Smith & Ragan, 1993,

p.49). For example, a person would be depicted as high on trait anxiety if the person has a inclination to be generally anxious, regardless of the situations (Smith & Ragan, 1993).

These three trait characteristics, including anxiety, locus of control, and academic self-concept can also be "states" that alter among individuals depending on the circumstance. For instance, a person who has a low trait anxiety and a high academic self-concept may have a high state anxiety and a low academic self-concept when facing highly unacquainted or complicated contentment. An individual who is regularly very internal in terms of locus of control may become very external when in an unacquainted or aggressive learning surroundings (Smith & Ragan, 1993).

Anxiety is one of the most ordinarily approved causes of motivationally caused deficiencies in performance (Humphreys & Revelle, 1984). Performance can be either facilitated or hindered by anxiety on simple tasks or when the feedback is positive. Performance is hindered by high anxiety on hard task or when the feedback is negative (Humphreys & Revelle, 1984). Moreover, a mass of data connect high test

anxiety with lower cognitive accomplishment, and these negative influences have been watched at all degrees of education (Snow, 1986).

The predominant theory implies that modest anxiety has an arousal-facilitative influence on cognitive performance, whereas high anxiety is weakening. The anxious learner's cognitive processing is interrupted by worries and self-doubts, turning his or her concentration away from the task and toward the self (Snow, 1986).

Spielberher (1972) has produced a tool, the Manifest Anxiety Scale (MAS), to determine a person's level of trait anxiety (and the changing characteristic of state anxiety). Though at or above a certain level, anxiety can hinder learning, many instructional arrangements, such as constant feedback, clear designation of expectations, and overlearning, can decrease the negative impacts of anxiety on learning (Smith & Ragan, 1993).

Locus of control is depicted as altering inclination to be "internal" or "external" in one's perceptions of the main source of impact in life occurrences (Smith & Ragan, 1993). For instance, to

ascribe a new promotion on the job to difficult work and persistence would be consistent with internal locus of control, whereas ascription of the occurrence to good luck or the impact of the other people would be consistent with external locus of control. Or, a failure to reach a aim would be likely to be connect with shortage of enough endeavor or ability from an internal locus of control view, whereas the external view would incline to ascribe the failure to something like bad fortune or some other cause external to one's self. As noted above, locus of control can alter in a person (Smith & Ragan, 1993). Moreover, however, many people incline to ascribe a persistent learning toward "internal-ness" or "external-ness" over time as a personality characteristic. For these persons, some alteration can be made to instruction to advance greater learning (Smith & Ragan, 1993).

The third one is academic self-concept. Though an individual's assessment of academic ability may alter by situation, it is often the case that students have formed a generalized image of themselves as learners after a surprisingly short time in schooling. If this image is affirmative it will encourage a positive

attitude toward learning and perseverance in learning tasks. If academic self-image is negative, learning can be significantly hindered (Smith & Ragan, 1993).

Summary

This review of literature of learner characteristics has suggested considerations when planning instruction. There are several areas of emphases: entry behavior, personal and social characteristics, characteristics of nonconventional learners, learning conditions, cognitive styles, and psychosocial traits.

For designing instruction, information about entry behavior and personal and social characteristics should receive attention. Attention also should be given to characteristics of nonconventional learners comprised of ethnic minority learners, disabled learners, and adult learners. For designing learning programs for individual learners, learning conditions and cognitive styles should be given consideration. For planning individualized learning programs, data about psychosocial traits, including trait anxiety, trait locus of control, and academic self-concept, should receive attention.

CHAPTER 3

Conclusion/Recommendations

Conclusion

The purpose of this study is to review literature related to the learner characteristics essential for the design of instruction. The following question is examined: What learner characteristics are essential for the design of instruction?

This study does support the conclusion that there are some learner characteristics essential for the design of instruction, such as entry behaviors, personal and social characteristics, and cognitive styles. However, depending on the instructional task, some learner characteristics may be more critical than others (Smith & Ragan 1993). For example, for designing individualized programs, some individual differences such as psychosocial traits and learning styles may be more critical than characteristic of nonconventional learners. On the other hand, in planning group-based programs, attention may need to be given to their general characteristics - such as characteristics of nonconventional learners. In

designing some certain subjects, some specific learner characteristics may need more attention than other learner characteristics.

Recommendations

- * Instructional designers may need to avoid turning information about learner characteristic essential for instructional design into stereotypes used to pigeon hole individuals. As presented by Dunn et al.(1981), "I feel there are great dangers in the misuse of learning style concepts. Specifically, we must avoid turning these ideas into stereotypes used to pigeon hole individuals" (P. 373).
- * In planning instructional design, the information about learner characteristics, including both individual differences and similarities among people, may need to be collected appropriately as much as possible. As presented by Smith and Ragan (1993) that "while information about an individual's learning styles (a "auditory learner", a "visual learner") may be helpful to that individual in regulating her own learning within a learning situation, this information is not typically

sufficiently prescriptive to aid instructional designers in making design decisions" (p. 48).

- * In planing instructional design, both individual differences and similarities among people should all receive attention. As pointed out by Smith and Ragan (1993): "Some schools of thought in education have emphasized individual differences, ignoring the important ways in which people alike. In fact, both similarities and differences are important" (p. 44).

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