

Cognitive and Learning Styles in Vocational Assessment:  
Importance and Practice

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Abstract

This article examines the importance of and rationale for vocational evaluators and others involved in human appraisal professions to integrate cognitive and learning styles into their assessment practices. The primary purpose of this article is to provide assessment personnel with an overview of learning style technology which when used appropriately can provide more equitable and appropriate vocational assessment services. Such improved services can lead to more successful vocational preparation and programming for individuals with disabilities. To accomplish this purpose, definitions of cognitive styles and learning styles, informal and formal assessment techniques, along with examples of observational clues will be described. The integration of learning style information into vocational appraisal recommendations will be discussed and a listing of frequently used, formal learning style instruments is included.

Cognitive and learning style theories and methodologies have gained increased attention in educational and industrial communities within the last two decades. The developmental processes of these theories and their applications have reached a stage where research and exemplary practices can be used to improve the instructional techniques and training strategies for individuals in a variety of settings. Although little has been written about the utility of these applications and practices in assessment, it is essential that they be incorporated into human appraisal approaches as well as instructional services. This is especially true regarding the implications that cognitive and learning style preferences have for individuals with disabilities, an area of study which is beginning to merit special consideration among experts and practitioners in vocational appraisal services.

The frequent appearance of articles in newspapers and periodicals and the number of presentations that are included in recent professional workshops, suggests that learning styles are part of a "styles megatrend" which is influencing education, training, and vocational appraisal services. Major corporations as well as human resource development specialists and educators are beginning to address the issue of individual styles, which include temperaments or worker preferences as well as management, trainer and learning styles.

In both industrial and educational settings, educators and trainers are aware that each individual differs significantly regarding how he or she approaches and uses information. Some of these professionals take the time to analyze individual styles in order to facilitate learning. Others, who conduct vocational assessment, can help individuals discover their learning styles or preferences in vocational contexts. In fact, attention to how an individual takes in, processes, and produces information in testing or assessment situations is as significant as analyzing correct or incorrect answers and final performance scores. It is implicit that the results of identifying these styles has a positive impact on current achievement and future productivity, and, in fact, can be used to enhance future learning and performing. This is particularly true for individuals who

typically experience problems learning or being acceptably productive.

An underlying premise of investigating and identifying learning styles implies that the individual worker, trainee or student is the critical factor in the workplace and schools. Focusing on individuals and their differences, makes it possible for institutional and systemic procedures and policies to reflect more humanistic and equitable approaches to teaching, training, employment, and appraisal. Often, an unfortunate outcome of attempts by institutions to provide equal services for all constituents result in standardization of services which may contribute to discriminating assessment and instructional practices. Though unintended these standardized services have helped to generate failures in educational settings, withdrawal from schools, extended rehabilitation time periods, and unmet production quotas in industry. Thus, it is critical that vocational evaluators and others who deliver assessment services, recognize the importance of individual differences (or unique preferences) and acquire skills to conduct appropriate and non-discriminatory learning style assessment.

#### Rationale for Learning Style Assessment

In addition to the natural desire of vocational appraisal personnel to provide optimal assessment experiences for their consumers, other, more regulatory reasons exist for incorporating assessment of learning styles into all vocational appraisal activities. Most vocational evaluators are aware of some of these regulatory directives; it depends on their work setting regarding those with which they are most familiar. In 1975, the first set of written standards for vocational assessment, in the Vocational Evaluation and Work Adjustment Final Report included modes of learning as an important element of vocational assessment and evaluation (Vocational Evaluation and Work Adjustment Association). A chief standard-setting body in the world of vocational rehabilitation, the Commission on Accreditation of Rehabilitation Facilities (CARF, 1983), requires that a client's "learning preferences be addressed in vocational evaluation and related service programs" (Blakemore, McCray & Coker, undated, p. v). Recent CARF standards continue to include this requirement.

In 1985, standards for professional certification also addressed learning

styles as one of the requisite skills or "knowledge and performance areas" for personnel to qualify for certification as a Certified Vocational Evaluator (CVE) (Commission on Certification of Vocational Evaluation and Work Adjustment Specialists, p.9). This requirement was strengthened by the Commission on Certification of Vocational Evaluation and Work Adjustment Specialists (CCWAVES) in the revised standards manual of 1986 (CCWAVES, p.12).

Finally, a major impetus for including learning styles in vocational assessment occurred as a result of the 1984 mandate, the Carl D. Perkins Vocational Education Act, P.L. 98-524. This law called for the assessment of handicapped and disadvantaged students who were enrolled in or may be planning to enroll in vocational education programs. The assessment assurance specified that a student's abilities, interests and special needs must be identified and form the basis of individualized career planning, vocational education programming and transitional services (P.L. 98-524, Sec. 204 (c)). Implementation guidelines disseminated by the Office of Vocational and Adult Education of the U.S. Department of Education clarified that learning styles or preferences should be included in each assessment (Conaway, n.d.). The fact that standards for the the delivery of services as well as for the professionals responsible for delivering them include learning styles reinforces the need for vocational appraisal experts to acquire a basic understanding of learning style methodology and approaches. In order to acquire skills related to the assessment of learning modalities and preferences, one needs to understand the differences between learning and performing.

#### Learning versus Performing

How people learn is as critical, if not more so, than what they learn or what they have learned. Often, identifying and accomodating an individual's most comfortable method of learning can determine whether or not information can actually be understood, organized and utilized. Thus, knowledge and application of learning styles information can facilitate the acquisition of information or knowledge. If learning style preferences are ignored or not addressed, the goals of education and training are likely to be inhibited.

Using this premise, it is imperative that vocational assessment and evaluation processes include the identification of learning styles as an ever-present component. One sign that this previously underutilized area of assessment is gaining acceptance is demonstrated by the inclusion of learning styles assessment in recent literature (Leconte, 1985; McCarron, 1984; McCray, 1979). Learning style identification during vocational assessment can serve as a key to removing barriers and gaining greater access to an individual's "real" performance potential. Again, if learning styles are not addressed early in an assessment process it is likely that discriminatory practices are occurring, (e.g., instructions being given for work samples, tests or situational assessments in only one mode, which may be one that is problematic for the individual being assessed).

Too often when vocational assessment and evaluation take place, vocational evaluators are not "seeing" an accurate or complete picture of an individual's capabilities. Rather they may be observing, recording, and what is worse, disseminating information and making recommendations which are based on false data. A primary, but infrequently noted error in assessment occurs when instructions for assessment activities or the mode of taking in and feeding back information is not compatible with the individual's preferred style or modality. The outcomes or what evaluators often see as "results" are actually the person's struggle to deal with or move beyond the way the activities or information were provided.

In such instances, the vocational evaluator may be observing learning rather than performing. For example, an evaluatee who is holding a trowel in an incorrect and awkward position, is unsuccessful throwing and fuowing mortar to build a brick wall and is displaying some inappropriate behavior. It could be that the individual is having difficulty because she requires a live demonstration for using the trowel to supplement the written directions and line drawings which are provided to all evaluatees. In addition to observing the person's frustration, the evaluator may be viewing the individual's efforts to learn, not perform, the best way to use the trowel.

Both learning and performing processes are important to observe, but the evaluator must be aware of the difference between the two in order to provide the least discriminatory appraisal

process and to make the most realistic and meaningful recommendations. A simple revision of work rating or observation forms can help focus the vocational evaluator's attention on both learning and performing. The revision entails either printing forms with "learning" and "performing" categories noted or making two columns for observations by drawing a vertical line down all rating forms--one column denotes learning, the other specifies performance notations.

Most vocational evaluators are committed to providing optimal services for their clients. To do this, they must understand the theoretical and practical aspects of integrating learning style technology into their programs. Thus, they will also be encouraging maximum levels of individual productivity.

#### Primer on Learning Styles

Numerous definitions of learning styles permeate the literature. For the purposes of vocational appraisal, learning style is defined as consisting of behaviors which serve as indicators of how persons learn and adapt to different environments. According to Travers who is quoted in Blakemore, McCray, & Coker (n.d.) this operational definition is based on the "cognitive requirements and the student's affective and physiological behaviors that serve as stable indicators of how learners perceive, interact with, and respond to the learning environment.". Put more simply, learning style can be thought of as "a personally preferred way of dealing with information and experience (Della-Dora & Blanchard, 1979 in Blakemore, McCray, & Coker, n.d.). To understand the full implications of this concept for each individual means observing and acquiring information on both a person's cognitive style and learning preferences. Again, the way a person learns will have a bearing on the acquisition of new knowledge, and also on how an individual thinks, responds, organizes and operates. The need to understand learning style does not imply that all clients will require extensive, in depth appraisal, however, it does mean that having several means of assessing learning styles will make the appraisal more accurate and more useful.

When examining cognitive styles and learning styles, the terms often are used interchangeably. For the purposes of this discussion the term learning style will be used, however, it is useful to understand that there are differences between the terms and the concepts they represent. Kogan states that "cognitive styles are individual variations in modes of perceiving, remembering and thinking, or as distinct ways of apprehending, storing, transforming, and utilizing information" (1971). The term cognitive styles refers to the more complex concepts of individual preferences or "what goes on inside the learner" (Gann, 1987).

Often, brain hemisphericity and "brainedness" or hemisphere dominance are associated with cognitive style definitions. In other words, individuals with strong right brain dominance may respond to visual cues and instructions more readily and easily than people who have left brain dominance. On the other hand, individuals with preferences for auditory instructions, are said to be left brain dominant (Bandler & Grinder, 1979; Gann, 1987). This does not mean that individuals who learn more easily via one modality over another are unable to learn through other modalities. Rather, their cognition is geared more toward one mode than another and they may have to struggle more to learn or master tasks when operating in a less preferred mode. The primary learning modalities, auditory, visual, and kinesthetic/tactile, are not the only determinants of cognitive preference. For example, evaluators can note the cognitive preferences of evaluatees when they are disassembling and reassembling an object. Individuals who appear to follow no particular routine or format may be exhibiting their right brain preference, while those who methodically align parts in a sequence or follow a pattern may well be demonstrating their left brain dominance. Care must be taken to ensure that the method of performance is not a manifestation of how they have learned or how they were trained. In order to suspect that individuals are right or left brained-oriented, these work

habits should be consistently observed on a variety of tasks in various settings.

On much broader terms, learning styles are used to refer to "what goes on inside the learner as well as what occurs between the learner and the external environment" (Gann, 1987). The identification of learning styles requires an ecological assessment strategy. The research and teachings of Rita and Kenneth Dunn and Gary Price (Dunn & Dunn, 1976 and 1979; National Association of Secondary School Principals, 1982 and 1979) can be useful and integrated into vocational appraisal processes and techniques. Based on their research, they created five categories of stimuli which impact on the learning preferences of individuals. The categories separate learning elements into environmental, emotional, sociological, physical, and psychological groups. Knowledge of these groups can facilitate and help organize the vocational evaluator's observations to identify and verify learning style preferences. The groups break out as follows:

<u>Stimuli</u>	<u>Elements</u>
Environmental	Sound, Light, Temperature, Design
Emotional	Motivation, Persistence, Responsibility, Structure
Sociological	Peers, Self, Pair, Team, Adult, Varied Group
Physical	Perceptual, Intake(food), Time, Mobility
Psychological	Analytic versus Global, Cerebral Dominance, Impulsive versus Reflective

(Dunn, R., 1980; Dunn & Dunn, 1979 and 1978; Gann, 1987).

Readers should use this article as it is intended, to provide an overview which will stimulate further investigation, study and practice by vocational appraisal personnel as they integrate learning style assessment into their services. The references listed at the end of the article can provide the more indepth information required before professionals can begin to implement such assessment

practices. Previously, the research, use, and training of learning style assessment occurred primarily within the domains of psychologists and educators. Lately, the topic has gained considerable attention by experts within the vocational rehabilitation and appraisal communities.

#### Research Involving Disabilities

The study of learning styles has been boosted recently by increased research activity in related areas such as basic brain functions, brain hemisphericity and dominance, cognitive losses due to traumatic brain injury, the relationship between learning disabilities and alternative instructional technologies, and effective instructional strategies for individuals with severe cognitive disabilities in relation to their abilities to generalize skills. Also, analysis of differences between the learning capabilities of blind and visually impaired persons and non-visually impaired people, has fostered new information about learning styles, which can be applied to vocational assessment (McCarron, 1984; Vitale, 1982).

The basic assumptions underlying learning style assessment are being verified by such research. For instance, the assumptions that learning style is not reflective or related to intelligence has been underscored. Everyone, regardless of their level of intelligence, possesses a unique learning style or set of cognitive preferences (Gann, 1987; Vitale, 1982).

New and evergrowing research which promises to generate another boost of interest in learning styles concerns the current educational emphasis on "at risk" students. For years some expert practitioners and researchers in vocational evaluation have contended that many individuals who learn via visual and/or kinesthetic or tactile modalities have encountered difficulties in educational and vocational training settings (Gann, 1987; Nadolsky, 1981; Ross, n.d.). By the time these students enroll in secondary schools, they often already have labels as educationally or academically disadvantaged and are "at

risk" of withdrawing or being pushed out of schools. Some educators argue, too, that many youth who carry the label of learning disabled may also simply represent individuals who learn or acquire information differently than ways in which they were typically taught. As these individuals reach high school their learning differences, indeed, have become learning problems. These students are learning disabled in the sense that they are handicapped by learning environments and modalities rather than by deficiencies within themselves.

As researchers and direct service providers have gained more insight into learning disabilities and learning styles, they have established some characteristics which may represent learners who can be mistakenly identified as having disabilities and/or who may stand a good chance of leaving education programs before finishing them (e.g. high school, vocational education, on-the-job training, college). The danger in presenting what may be common characteristics (or a typical profile) concerns the potential many people have to presume that these are characteristic of all such learners. Often, having such a profile, causes people to expect or "look for" these traits, which is unfair.

At the risk of encouraging such an error, the following is one example of an "underachieving profile" according to Gann's study of Tapenden's research (1987). In an instructional or training setting the individual with an "underachieving profile" needs sound present, prefers dim light, likes informal versus formal designs (e.g., sitting in soft chairs with feet propped up), working with peers rather than alone (peers, in this case refers to individuals who are on the same intellectual level rather than chronological age), having an authority figure present or available, receiving input through a tactile/kinesthetic mode, having frequent food intake, having the opportunity for mobility, and working in the afternoon or evening. The profile includes impulsivity rather than reflectiveness and indicates an inclination toward right brain dominance.

### Informal and Formal Learning Style Assessment Techniques

Knowledge of good assessment practices is as important in the assessment of learning styles as it is in all human appraisal activities. Both informal and formal assessment procedures have a place in determining and verifying an individual's preferred style of learning. As in recommended practices for interest assessment, it is important to look beyond formal test instrument results and use observations and other informal techniques to substantiate findings. In other words, evaluators are encouraged to synthesize the results of tested, expressed, and manifested learning styles into a unique individual profile.

This approach is particularly important since, generally, the instruments available for assessing learning styles are not designed for or validated for special needs populations. Two exceptions are the Trainee Performance Sample (TPS), which was developed and researched specifically for individuals with severe cognitive disabilities and the Perceptual Memory Task (McCarron, 1983), which has been researched extensively with individuals who are blind, visually impaired, traumatically brain injured, and learning disabled.

Also, as in any assessment process, the information gained should be incorporated into useful recommendations in order that planning and programming for instruction, counseling, and placement decisions can be enhanced.

### Assessing Informally

A frequently overlooked method for initiating information gathering on learning styles simply involves asking the individual being assessed to talk about his/her experiences in school or training situations. Often a discussion of subjects most enjoyed, areas of difficulty frequently encountered, and an accounting of hobbies and pastimes will provide clues to an individual's style. Probing whether one would prefer to learn a new skill by being told how to do it, reading about how

to do it, or trying to work it out with pictorial directions will involve the student or client in a process of self discovery and will give the evaluator some ideas to investigate. If someone has difficulty verbalizing preferences, they can be given a listing of concrete examples from which to make selections.

Empowering the individual by actively involving him/her throughout the assessment process in sharing observations about directions and activities which were easy or difficult to follow will improve the validity of the results. With lower functioning individuals, tasks can be constructed or work tasks (e.g. "homemade" or locally constructed work samples, commercial samples without using the norms, situational assessments) can be used to try out different modes of providing information. The evaluator's observations about the external and implied internal organization that takes place as a individual works are of paramount importance. For example, does the individual use fingers to count or identify points, (kinesthetic), does output show a style of organization such as placing tools and materials in the order they will be used, or is there apparent confusion following oral directions possibly indicating that auditory memory is not a strong mode of learning? Keys to observations can be organized by asking questions regarding the: input mode for the task, the level and type of mental activity involved in the task, and finally, the mode of output for the given task.

There are several other informal methods for assessing learning style, some of which include

- o open-ended questions or interviews;
- o observations using rating forms or checklists;
- o review of anecdotal and observational records;
- o self-description and report by writing or drawing;
- o dominance screening checklists--related to eye dominance and brain dominance (Vitale, 1982);

- o eye tracking activities (Bandler & Grinder, 1979);
- o visual-auditory-kinesthetic screening (Barbe & Swassing, 1979)
- o analysis of products of learning, such as results of work samples (Guild & Garger, 1985);
- o observations noted during testing (psychometric) situations.

As with any new technique or strategy, it is imperative to have a protocol regardless of how unsophisticated it may be. Also one should either seek out training in order to conduct the assessment in the most appropriate and accurate manner or practice the technique until achieving mastery.

#### Formal Assessment

Formal instruments for assessing learning preferences range from some which were developed through research or demonstration projects and are now available in the public domain to those which have been researched extensively and are available from commercial publishers. Two which were developed by practitioners with support from public funds were the C.I.T.E. Learning Styles Instrument, which is undated and the Edmonds Learning Style Identification Exercise or E.L.S.I.E., which is also undated. More information on these instruments and examples of more standardized instruments can be found in Figure One.

Two popular, commercially published instruments are the TLC Learning Style Inventory developed by Hanson and Silver (1980) and the Learning Styles Inventory created and researched by Dunn, Dunn, and Price (1979). Readers can seek additional information about formal instruments by contacting publishers listed in Figure 1. Vocational evaluators should note when selecting and using formal tools that many use the traditional approach of employing paper and pencil in order to make responses. Also, many use only one modality when making inquiries, such as reading all questions without the use of visual or kinesthetic reinforcers. By far, the best approach for any aspect of vocational assessment involves multi-modal

techniques. This is true even after primary learning preferences have been identified.

It is understood that the customary practices of utilizing more than one instrument and more than one approach should be employed in learning style assessment. For instance, after questioning the evaluatee about his or her favorite way of learning and administering the ELSIE, work sample or community-based observations should include learning preferences and, if necessary, the TLC Learning Style Inventory could be given.

#### Summary

Style assessment is emerging as a valuable approach in determining vocational preferences, vocational abilities, and potential for vocational training and placement. Specifically, learning style assessment can make critical contributions to the improvement of vocational assessment services and, in turn, the integration into individual vocational plans detailing how individuals best receive, process, and use information can represent a key element in the degree of success individuals will experience in vocational settings. Because individuals with disabilities often experience less success in educational, vocational training, and employment environments, the incorporation of learning style assessment into all vocational appraisal processes is essential to enhance their academic and vocational experiences. Vocational evaluators have often included information on learning styles in their assessment activities and in the feedback they provide referral agents. It is hoped that the content of this article will encourage these professionals to upgrade the learning style assessment techniques they use as well as motivate others who do not feel comfortable conducting such assessment to investigate learning preference assessment further.

## Figure 1

- Formal Learning Style Instrument Resource List
- Center for Innovative Teaching Experiences (C.I.T.E.) Learning Styles Instrument: Developed by Bablitch, Burdine, Albright, and Randol, Wichita Public Schools, Murdock Teacher Center, 670 N. Edgemoor, Wichita, Kansas 67208.
- Edmonds Learning Style Identification Exercise (ELSIE): Developed by Edmonds High School, Edmonds, Washington. Adapted by Jill Gann, Anne Arundel County Public Schools, 2644 Riva Road, Annapolis, Maryland 21043.
- Learning Styles Inventory (LSI): Developed by Rita and Kenneth Dunn and Gary Price. Available from Price Systems, Inc., Box 1818, Lawrence, Kansas 66044-7892.
- National Association of Secondary School Principals (NASSP) Learning Style Profiles: Developed by James W. Keefe and John S. Monk. Available from the National Association of Secondary School Principals, 1904 Association Drive, Reston, Virginia 22091.
- Productivity Environmental Preference Survey (PEPS): Developed by Gary Price. Available from Price Systems, Inc., P.O. Box 1818, Lawrence, Kansas 66044-7892.
- The Swassing-Barbe Modality Index (SBMI): Developed by R.H. Swassing and W.B. Barbe. Available from Zaner-Bloser, Inc., 612 North Park Street, Columbus, Ohio 43215.
- TLC Learning Style Inventory (TLC-LSI): Developed by J. Robert Hanson and Harvey F. Silver. Available from Hanson, Silver, Strong & Associates, Inc., P.O. Box 402, Moorestown, New Jersey 08057.
- Trainee Performance Sample (TPS): Available from Ideal Development Labs, P.O. Box 27518, West Allis, Wisconsin 53227.

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