

**Experiential Learning Theory:
Previous Research and New Directions**

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Experiential Learning Theory: Previous Research and New Directions

Experiential Learning Theory (ELT) provides a holistic model of the learning process and a multilinear model of adult development, both of which are consistent with what we know about how people learn, grow, and develop. The theory is called “Experiential Learning” to emphasize the central role that experience plays in the learning process, an emphasis that distinguishes ELT from other learning theories. The term “experiential” is used therefore to differentiate ELT both from cognitive learning theories, which tend to emphasize cognition over affect, and behavioral learning theories that deny any role for subjective experience in the learning process.

Another reason the theory is called “experiential” is its intellectual origins in the experiential works of Dewey, Lewin, and Piaget. Taken together, Dewey’s philosophical pragmatism, Lewin’s social psychology, and Piaget’s cognitive-developmental genetic epistemology form a unique perspective on learning and development. (Kolb, 1984).

The Experiential Learning Model and Learning Styles

Experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience"(Kolb 1984, p. 41). The ELT model portrays two dialectically related modes of grasping

experience -- Concrete Experience (CE) and Abstract Conceptualization (AC) -- and two dialectically related modes of transforming experience -- Reflective Observation (RO) and Active Experimentation (AE). According to the four-stage learning cycle depicted in Figure 1, immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences.

Insert Figure 1 about here

A closer examination of the ELT learning model suggests that learning requires abilities that are polar opposites, and that the learner must continually choose which set of learning abilities he or she will use in a specific learning situation. In grasping experience some of us perceive new information through experiencing the concrete, tangible, felt qualities of the world, relying on our senses and immersing ourselves in concrete reality. Others tend to perceive, grasp, or take hold of new information through symbolic representation or abstract conceptualization – thinking about, analyzing, or systematically planning, rather than using sensation as a guide. Similarly, in transforming or processing experience some of us tend to carefully watch others who are involved in the

experience and reflect on what happens, while others choose to jump right in and start doing things. The watchers favor reflective observation, while the doers favor active experimentation.

Each dimension of the learning process presents us with a choice. Since it is virtually impossible, for example, to simultaneously drive a car (Concrete Experience) and analyze a driver's manual about the car's functioning (Abstract Conceptualization), we resolve the conflict by choosing. Because of our hereditary equipment, our particular past life experiences, and the demands of our present environment, we develop a preferred way of choosing. We resolve the conflict between concrete or abstract and between active or reflective in some patterned, characteristic ways. We call these patterned ways "learning styles."

The Learning Style Inventory and the Four Basic Learning Styles

In 1971 David Kolb developed the Learning Style Inventory (LSI) to assess individual learning styles. While individuals tested on the LSI show many different patterns of scores, research on the instrument has identified four statistically prevalent learning styles -- Diverging, Assimilating, Converging, and Accommodating (Figure 1). The following summary of the four basic learning styles is based on both research and clinical observation of these patterns of LSI scores (Kolb, 1984, 1999a, 1999b).

Diverging. The Diverging style's dominant learning abilities are Concrete Experience (CE) and Reflective Observation (RO). People with this learning style are best at viewing concrete situations from many different points of view. It is labeled "Diverging" because a person with it performs better in situations that call for generation of ideas, such as a "brainstorming" session. People with a Diverging learning style have broad cultural interests and like to gather information. Research shows that they are interested in people, tend to be imaginative and emotional, have broad cultural interests, and tend to specialize in the arts. In formal learning situations, people with the Diverging style prefer to work in groups, listening with an open mind and receiving personalized feedback.

Assimilating. The Assimilating style's dominant learning abilities are Abstract Conceptualization (AC) and Reflective Observation (RO). People with this learning style are best at understanding a wide range of information and putting into concise, logical form. Individuals with an Assimilating style are less focused on people and more interested in ideas and abstract concepts. Generally, people with this style find it more important that a theory have logical soundness than practical value. The Assimilating learning style is important for effectiveness in information and science careers. In formal learning situations, people with this style prefer readings, lectures, exploring analytical models, and having time to think things through.

Converging. The Converging style's dominant learning abilities are Abstract Conceptualization (AC) and Active Experimentation (AE). People with this learning style are best at finding practical uses for ideas and theories. They have the ability to solve problems and make decisions based on finding solutions to questions or problems. Individuals with a Converging learning style prefer to deal with technical tasks and problems rather than with social issues and interpersonal issues. These learning skills are important for effectiveness in specialist and technology careers. In formal learning situations, people with this style prefer to experiment with new ideas, simulations, laboratory assignments, and practical applications.

Accommodating. The Accommodating style's dominant learning abilities are Concrete Experience (CE) and Active Experimentation (AE). People with this learning style have the ability to learn from primarily "hand-on" experience. They enjoy carrying out plans and involving themselves in new and challenging experiences. Their tendency may be to act on "gut" feelings rather than on logical analysis. In solving problems, individuals with an Accommodating learning style rely more heavily on people for information than on their own technical analysis. This learning style is important for effectiveness in action-oriented careers such as marketing or sales. In formal learning situations, people with the Accommodating learning style prefer to work with others to get assignments

done, to set goals, to do field work, and to test out different approaches to completing a project.

Factors that Shape and Influence Learning Styles

The above patterns of behavior associated with the four basic learning styles are shown consistently at various levels of behavior. During the last three decades researchers have examined the characteristics of learning styles at five particular levels of behavior: Personality types, early educational specialization, professional career, current job role, and adaptive competencies. We summarize briefly these research findings in Table 1 and discuss them below.

 Insert Table 1 about here

Personality Types. ELT follows Carl Jung in recognizing that learning styles result from individuals' preferred ways for adapting in the world. Jung's Extraversion/Introversion dialectical dimension as measured by the Myers-Briggs Type Indicator (MBTI) correlates with the Active/Reflective dialectic of ELT as measured by the LSI; and the MBTI Feeling/Thinking dimension correlates with the LSI Concrete Experience/ Abstract Conceptualization dimension. The MBTI Sensing type is associated with the LSI Accommodating learning style and the MBTI Intuitive type with the LSI Assimilating style. MBTI Feeling types

correspond to LSI Diverging learning styles and Thinking types to Converging styles.

The above discussion implies that the Accommodating learning style is the Extraverted Sensing type, and the Converging style the Extraverted Thinking type. The Assimilating learning style corresponds to the Introverted Intuitive personality type and the Diverging style to the Introverted Feeling type. Myers (1962) descriptions of these MBTI types are very similar to the corresponding LSI learning styles as described by ELT (see also Kolb, 1984, pp: 83-85).

Educational Specialization. Early educational experiences shape people's individual learning styles by instilling positive attitudes toward specific sets of learning skills and by teaching students how to learn. Although elementary education is generalized, there is an increasing process of specialization that begins at high school and becomes sharper during the college years. This specialization in the realms of social knowledge influences individuals' orientations toward learning, resulting to particular relations between learning styles and early training in an educational specialty or discipline.

People with undergraduate majors in the Arts, History, Political science, English, and Psychology tend to have Diverging learning styles, while those majoring in more abstract and applied areas like Physical Sciences and Engineering have Converging learning styles. Individuals with Accommodating

styles have educational backgrounds in Business and Management, and those with Assimilating styles in Economics, Mathematics, Sociology, and Chemistry.

Professional Career Choice. A third set of factors that shape learning styles stems from professional careers. One's professional career choice not only exposes one to a specialized learning environment, but it also involves a commitment to a generic professional problem, such as social service, that requires a specialized adaptive orientation. In addition, one becomes a member of a reference group of peers who share a professional mentality, and a common set of values and beliefs about how one should behave professionally. This professional orientation shapes learning style through habits acquired in professional training and through the more immediate normative pressures involved in being a competent professional.

Research over the years has shown that social service (i.e., psychology, nursing, social work, public policy) and arts and communications professions (i.e., theater, literature, design, journalism, media) comprise people who are heavily or primarily Diverging in their learning style. Professions in the sciences (i.e., biology, mathematics, physical sciences) and information or research (i.e., educational research, sociology, law, theology) have people with an Assimilating learning style. The Converging learning styles tends to be dominant among professionals in the fields of technology (i.e., engineering, computer sciences, medical technology), economics, and environment science (i.e., farming,

forestry). Finally, the Accommodating learning style characterizes people with careers in organizations (i.e., management, public finance, educational administration) and business (i.e., marketing, government, human resources).

Current Job Role. The fourth level of factors influencing learning style is the person's current job role. The task demands and pressures of a job shape a person's adaptive orientation. Executive jobs, such as general management, that require a strong orientation to task accomplishment and decision making in uncertain emergent circumstances require an Accommodating learning style. Personal jobs, such as counseling and personnel administration, that require the establishment of personal relationships and effective communication with other people demand a Diverging learning style. Information jobs, such as planning and research, that require data gathering and analysis, as well as conceptual modeling, have an Assimilating learning style requirement. Technical jobs, such as bench engineering and production that require technical and problem-solving skills require a convergent learning orientation.

Adaptive competencies. The fifth and most immediate level of forces that shapes learning style is the specific task or problem the person is currently working on. Each task we face requires a corresponding set of skills for effective performance. The effective matching of task demands and personal skills results in an adaptive competence. The Accommodative learning style encompasses a set of competencies that can best be termed Acting skills: Leadership, Initiative, and

Action. The Diverging learning style is associated with Valuing skills: Relationship, Helping others, and Sense-making. The Assimilating learning style is related to Thinking skills: Information-gathering, Information-analysis, and Theory building. Finally, the Converging learning style is associated with Decision skills like Quantitative Analysis, Use of Technology, and Goal-setting (Kolb, 1984).

An Overview of Research on ELT and the LSI: 1971-1999

What has been the impact of ELT and the LSI on scholarly research?

Since ELT is a holistic theory of learning that identifies learning style differences among different academic specialties, it is not surprising to see that ELT/LSI research is highly interdisciplinary, addressing learning and educational issues in several fields. Since the first publications in 1971 (Kolb, 1971; Kolb, Rubin & McIntyre, 1971) there have been many studies of the ELT and LSI. The most recent update of the Bibliography of Research on Experiential Learning Theory and The Learning Style Inventory (Kolb & Kolb, 1999) includes 990 entries.

Table 2 shows the distribution of these studies by field and publication period. The field classification categories are: Education (including k-12, higher education, and adult learning), Management, Computer/Information Science, Psychology, Medicine, Nursing, Accounting, and Law. Studies were also classified as early (1971-1984) or recent (1985-1999). In addition to being the

mid-point of the 28 1/2 year history of the work, the division makes sense in that the most comprehensive statement of ELT, Experiential Learning, was published in 1984, and the original LSI was first revised in 1985.

Insert Table 2 about here

Table 2 also shows the distribution of the 990 studies according to the publication type. More than 50% of the studies were published in journals and another approximately 20% were doctoral dissertations. 10% of the studies were either books or book chapters, and the remaining 150 studies were conference presentations, technical manuals, working papers, and master theses. Numbers should be considered approximate since a few recent citations have yet to be verified by abstract or full text. Also, classification by field is not easy because many studies are interdisciplinary. However, the Bibliography does probably give a fair representation of the scope, topics and trends in ELT/LSI research. The following is a brief overview of research activity in the various fields.

Education

The education category includes the largest number of ELT/LSI studies. The bulk of studies in education are in higher education (excluding professional education in the specific fields identified below). K-12 education accounts for a

relatively small number, as does adult learning alone. However, in many cases adult learning is integrated with higher education. A number of studies in the education category have been done in other cultures--UK, Canada, Australia, Finland, Israel, Thailand, China, Melanesia, Spain, Malta, and American Indian.

Many of the studies in higher education use ELT and the LSI as a framework for educational innovation. These include research on the matching of learning style with instructional method and teaching style and curriculum and program design using ELT (e.g., Claxton & Murrell, 1987). A number of publications assess the learning style of various student, faculty and other groups.

Other work includes theoretical contributions to ELT, ELT construct validation, LSI psychometrics and comparison of different learning style assessment tools. In adult learning there are a number of publications on ELT and adult development, moral development, and career development. The work of Sheckley and colleagues on adult learning at the University of Connecticut is noteworthy here (e.g., Allen, Sheckley, & Keeton 1992; Travers, 1998). K-12 education research has been primarily focused on the use of ELT as a framework for curriculum design, particularly in language and science. (e.g., McCarthy, 1996; Hainer, 1992)

Management

ELT/LSI research was first published in management and there has continued to be substantial interest in the topic in the management literature. Studies can be roughly grouped into four categories--management and organizational processes, innovation in management education, theoretical contributions to ELT including critique, and psychometric studies of the LSI. Cross-cultural ELT/LSI research has been done in Poland, New Zealand, Australia, Canada, UK, and Singapore. In the management/organization area, organizational learning is a hot topic. Dixon's (1999) new book The Organizational Learning Cycle is an excellent example.

Another group of studies has examined the relationship between learning style and management style, decision-making, and problem solving. Other work has measured work related learning environments and investigated the effect of a match between learning style and learning environment on job satisfaction and performance. ELT has been used as a framework for innovation in management education including research on matching learning styles and learning environments, program design and experiential learning in computerized business games (e.g., Boyatzis, Cowen, & Kolb, 1995; Lengnick-Hall & Sanders, 1997).

Other education work has been on training design, management development and career development. Another area of research has been on the development and critique of ELT. Most psychometric studies of the LSI in the

early period were published in management, while recent psychometric studies have been published in psychology journals. Hunsaker reviewed the early studies in management and concluded, "The LSI does not demonstrate sufficient reliability to grant it the predictive reliability that such a measurement instrument requires. The underlying model, however, appears to receive enough support to merit further use and development." (1981, p. 151)

Computer and Information Science

The LSI has been used widely in computer and information science particularly to study end-user software use and end-user training (e.g., Bostrom, Olfman, & Sein, 1990; Davis & Bostrom, 1993). Of particular interest for this book on individual differences in cognitive and learning styles is the debate about whether these differences are sufficiently robust to be taken in account in the design of end-user software and end user computer training. Other studies have examined the relationship between learning style and problem solving and decision making, on line search behavior, and performance in computer training and computer assisted instruction.

Psychology

Studies in psychology have shown a large increase over time, with 77% of the studies in the recent period. Many of these recent studies were on LSI

psychometrics. The first version of the LSI was released in 1976 and received wide support for its strong face validity and independence of the two ELT dimensions of the learning process (Marshall & Meritt, 1985; Katz, 1986). Although early critique of the instrument focused on the internal consistency of scales and test-retest reliability, a study by Ferrell (1983) showed that the LSI version 1 was the most psychometrically sound among four learning instruments of that time. In 1985 version 2 of the LSI was released and improved the internal consistency of the scales (Veres, Sims, & Shake, 1987; Sims, Veres, Watson, & Buckner, 1986). Critiques of this version focused their attention on the test-retest reliability of the instrument, but a study by Veres, Sims, and Locklear (1991) showed that randomizing the order of the LSI version 2 items results in dramatic improvement of test-retest reliability. This finding led to an experimental research and finally to the latest LSI revision, LSI Version 3 (Kolb 1999a). The LSI version 3 has significantly improved psychometric properties, especially test-retest reliability (see Kolb, 1999b).

Other research includes factor analytic studies of the LSI, construct validation studies of ELT using the LSI, and comparison of the LSI with other learning style and cognitive style measures. Another line of work uses ELT as a model for personal growth and development, including examination of counselor/client learning style match and its impact on counseling outcomes.

Notable here is the work of Hunt and his colleagues at the Ontario Institute for Studies in Education (Hunt, 1992,1987).

Medicine

The majority of studies in medicine focus on learning style analysis in many medical education specialties--residency training, anesthesia education, family medicine, surgical training, and continuing medical education. Of significance here is the program of research by Baker and associates (e.g., Baker, Cooke, Conroy, Bromley, Hollon, & Alpert, 1988; Baker, Reines, & Wallace, 1985). Also Curry (1999) has done a number of studies comparing different measures of learning styles. Other research has examined clinical supervision and patient/physician relationships, learning style and student performance on examinations, and the relationship between learning style and medical specialty career choice.

Nursing

ELT/LSI research has also increased dramatically with 81% of the nursing studies in the recent period. In 1990 Laschinger reviewed the experiential learning research in nursing and concluded, "Kolb's theory of experiential learning has been tested extensively in the nursing population. Researchers have investigated relationships between learning style and learning preferences,

decision-making skills, educational preparation, nursing roles, nursing specialty, factors influencing career choices and diagnostic abilities. As would be expected in a human service profession, nursing learning environments have been found to have a predominantly concrete learning press, matching the predominating concrete styles of nurses...Kolb's cycle of learning which requires the use of a variety of learning modalities appears to be a valid and useful model for instructional design in nursing education" (p. 991).

Accounting

There has been considerable interest in ELT/LSI research in accounting education, where there have been two streams of research activity. One is the comparative assessment of learning style preferences of accounting majors and practitioners, including changes in learning style over the stages of career in accounting and the changing learning style demands of the accounting profession primarily due to the introduction of computers. Other research has been focused on using ELT to design instruction in accounting and studying relationships between learning style and performance in accounting courses.

In 1991 Stout and Ruble reviewed ELT/LSI research in accounting education. Reviewing the literature on predicting the learning styles of accounting students they found mixed results and concluded that low predictive and classification validity for the LSI was a result of weak psychometric qualities

of the original LSI and response set problems in the LSI 1985. They tentatively recommended the use of the randomized version proposed by Veres, Sims, and Locklear (1991). They write, "researchers who wish to use the LSI for predictive and classification purposes should consider using a scrambled version of the instrument", and note, "...it is important to keep in mind that assessing the validity of the underlying theoretical model (ELT) is separate from assessing the validity of the measuring instrument (LSI). Thus, for example, the theory may be valid even though the instrument has psychometric limitations. In such a case, sensitivity to differences in learning styles in instructional design may be warranted, even though assessment of an individual's learning style is problematic" (p. 50).

Law

We are now seeing the beginning of significant research programs in legal education, for example the program developed by Reese (1998) using learning style interventions to improve student learning at the University of Denver Law School.

Evaluation of ELT and the LSI

There have been two recent comprehensive reviews of the ELT/LSI literature, one qualitative and one quantitative. In 1991 Hickox extensively

reviewed the theoretical origins of ELT and qualitatively analyzed 81 studies in accounting and business education, helping professions, medical professions, post-secondary education and teacher education. She concluded that overall 61.7% of the studies supported ELT, 16.1% showed mixed support, and 22.2% did not support ELT.

In 1994 Iliff conducted a meta-analysis of 101 quantitative studies culled from 275 dissertations and 624 articles that were qualitative, theoretical, and quantitative studies of ELT and the LSI. Using Hickox's evaluation format he found that 49 studies showed strong support for the LSI, 40 showed mixed support and 12 studies showed no support. About half of the 101 studies reported sufficient data on the LSI scales to compute effect sizes via meta-analysis. Most studies reported correlations he classified as low ($<.5$) and effect sizes fell in the weak (.2) to medium (.5) range for the LSI scales. In conclusion Iliff suggests that the magnitude of these statistics is not sufficient to meet standards of predictive validity.

Most of the debate and critique in the ELT/LSI literature has centered on the psychometric properties of the LSI. Results from this research have been of great value in revising the LSI in 1985 and again in 1999. Other critique, particularly in professional education, has questioned the predictive validity of the LSI. Iliff correctly notes that the LSI was not intended to be a predictive psychological test like IQ, GRE or GMAT. The LSI was originally developed as

a self-assessment exercise and later used as a means of construct validation for ELT. Tests designed for predictive validity typically begin with a criterion like academic achievement and work backward in an a-theoretical way to identify items or tests with high criterion correlations. Even so, even the most sophisticated of these tests rarely rises above a .5 correlation with the criterion. For example, while Graduate Record Examination Subject Test scores are better predictors of first-year graduate school grades than either the General Test score or undergraduate GPA, the combination of these three measures only produces multiple correlations with grades ranging from .4 to .6 in various fields (Anastasi & Urbina, 1997). While researchers in the professions are understandably searching for measures with high predictive validity to aid in decision-making, a more realistic approach than relying on any single measure is to rely on prediction from new multi-trait multi-method techniques such as structural equation modeling (e.g. White & Manolis, 1997; Coover 1993; Travers, 1998).

Construct validation is not focused on an outcome criterion, but on the theory or construct the test measures. Here the emphasis is on the pattern of convergent and discriminant theoretical predictions made by the theory. Failure to confirm predictions calls into question the test and the theory. "However, even if each of the correlations proved to be quite low, their cumulative effect would be to support the validity of the test and the underlying theory" (Selltiz, Jahoda, Deutsch, & Cook, 1960, p. 160). Judged by the standards of construct validity

ELT has been widely accepted as a useful framework for learning centered educational innovation, including instructional design, curriculum development, and life-long learning. Field and job classification studies viewed as a whole also show a pattern of results consistent with the ELT structure of knowledge theory described in Table 1.

Recent critique has been more focused on the theory than the instrument examining the intellectual origins and underlying assumptions of ELT from what might be called a post-modern perspective where the theory is seen as individualistic, cognitivist, and technological (e.g. Vince, 1998; Holman, 1997; Hopkins, 1993).

New Directions in ELT: From Specialized to Balanced Learning Styles

To date the vast majority of ELT-related research has examined conditions of extreme learning specialization; a new direction for ELT is the empirical testing of its theoretical propositions with regard to integrated learning. Integrated learning is conceptualized as an idealized learning cycle or spiral where the learner "touches all the bases"--experiencing, reflecting, thinking, and acting--in a recursive process that is responsive to the learning situation and what is being learned. The theory argues that this development in learning sophistication results from the integration of the dual dialectics of the learning process as shown in Figure 2.

 Insert Figure 2 about here

In developmental terms there are three orders of learning styles as shown in Table 3. The first includes the specialized or basic learning styles described earlier -- Diverging, Assimilating, Converging, and Accommodating. People with a basic learning style resolve the dialectics of the learning process by specializing in some modes at the expense of others. These learning styles correspond to the base of the ELT developmental cone portrayed in Figure 2.

 Insert Table 3 about here

The second-order learning styles represent learning orientations that integrate one of the two dialectics of the learning process, combining therefore the abilities of two basic learning styles. Abbey, Hunt, and Weiser (1985) and Hunt (1987) call these learning styles Northerner, Easterner, Southerner, and Westerner (see also Kolb, 1984, chapter 6). The names correspond to the spatial location of these learning styles in the two-dimensional LSI cycle.

The Northerner learning style integrates the Reflective Observation / Active Experimentation dialectic, and specializes in Concrete Experience. It combines therefore the characteristics and abilities of the Diverging and

Accommodating basic styles. People with the Easterner learning style are flexible in the Concrete Experience / Abstract Conceptualization dimension, but specialize in Reflective Observation. They combine thus learning skills associated with the Diverging and Assimilating basic styles. Southerners combine elements from the Assimilating and Converging styles, being flexible in the Reflective Observation / Active Experimentation dimension and specializing in Abstract Conceptualization. Westerners integrate the learning modes of Concrete Experience and Abstract Conceptualization, but specialize in Active Experimentation (Hunt, 1987). The four second-order learning styles correspond to the middle part of the developmental cone shown in Figure 2.

In the third-order of learning styles we have three Balanced learning profiles which correspond to the apex of the ELT developmental cone shown in Figure 2. All three Balanced profiles are manifestations of integrated learning in the sense that people with these styles learn in a holistic way, utilizing effectively the abilities associated with all four learning modes. The slight difference between the three Balanced profiles is that the first among them emphasizes the Concrete Experience/ Abstract Conceptualization dimension more than the Reflective Observation/ Active Experimentation dimension, while the inverse is the case with the second profile. The third balanced profile emphasizes equally both dimensions.

What do we know about these second and third-order styles? Not much, because the few related studies, although inspiring, have been unsystematic. One of the reasons that has prevented the systematic empirical investigation of balanced learning profiles is that past research has relied exclusively on the LSI. It is only recently that a system of commensurate instruments was developed to assess the full range of ELT constructs. The commensurate ELT instruments include, apart from the LSI, the Adaptive Style Inventory (ASI) and the Learning Skills Profile (LSP). These instruments have been designed to be theoretically commensurate while methodologically diverse in order to reduce spurious common method variance among them.

The second new direction therefore is the comprehensive assessment of the ELT constructs through the LSI, ASI, and LSP. This broadens the research focus to include not only learning preferences, but also flexibility and skills. The Adaptive Style Inventory (Boyatzis & Kolb, 1993) uses a paired comparison method to rank learning preferences for the four learning modes in eight personalized learning contexts. It measures adaptive flexibility in learning, the degree to which one changes learning style to respond to different learning situations in their life. Earlier studies found that adaptive flexibility is positively related to higher levels of ego development on Loevinger's instrument (Kolb & Wolfe, 1981). Individuals with high adaptive flexibility are more self-directed, have richer life structures, and experience less conflict in their lives (Kolb, 1984).

The Learning Skills Profile (Boyatzis & Kolb, 1991, 1995) uses a modified Q-sort method to assess level of skill development in four skill areas that are related to the four learning modes--Interpersonal Skills (Concrete Experience), Information Skills (Reflective Observation), Analytical Skills (Abstract Conceptualization) and Behavioral Skills (Active Experimentation). Several recent studies have used the LSP in program evaluation (Ballou, Bowers, Boyatzis, & Kolb, 1999; Boyatzis, Cowen, & Kolb, 1995) and learning needs assessment (Boyatzis & Kolb, 1995, 1997; Rainey, Hekelman, Glazka, & Kolb, 1993; Smith 1990).

Taken together the LSI, ASI, and LSP provide us with greater flexibility in testing the constructs of ELT and learning more about balanced learning profiles. In our most recent study (Mainemelis, Boyatzis, & Kolb, 1999) we employed the three instruments to test a fundamental ELT hypothesis: That the more balanced people are in their learning orientation on the LSI, the greater will be their adaptive flexibility on the ASI. We used two different indicators of a balanced learning profile, the LSI scores on the Abstract/Concrete and Active/Reflective dimensions. The results supported our hypotheses showing that people with balanced learning profiles in both dimensions are more sophisticated (adaptively flexible) learners. The magnitude of the correlations was stronger for the balanced profile on the Abstract/Concrete dimension, a fact that deserves further investigation. Other results supported our corollary predictions that

individuals with specialized LSI learning styles will show greater level of skill development in the commensurate skill quadrant of the LSP.

The study also produced some unexpected or contrary to our predictions results. For example, while we predicted that specialized learning styles will show less adaptive flexibility on the ASI, the results showed that this is true only for the abstract learning styles but not for the concrete styles; the latter are positive related to adaptive flexibility. Finally, while we expected that the more balanced one's learning style is on the LSI, the greater level of skill development he or she will show on the LSP, the results suggested that skill development is more related to specialization in learning style rather than balance.

Although our recent research has largely supported the ELT constructs with regard to integrated learning, we conclude in that paper that, in order to assess effectively the characteristics of balanced learning styles, much more work is needed -- from further mathematical analysis of the LSI scores and ASI formulae, to clinical observation of integrated learning orientations (Mainemelis, Boyatzis, & Kolb, 1999). These new research directions, coupled with the growing dissemination of ELT in various Academic disciplines, bring Experiential Learning Theory back to its basics: the creative exploration of the links between experience, learning, and development across the social spectrum.

In the emerging, networked world of information-based economies, learning is becoming more important than productivity in determining a person's

or an organization's adaptation, survival, and growth (Kelly, 1999). Increasingly complex and service-oriented jobs demand flexibility as a requirement for sanity and success. We believe that Experiential Learning Theory helps us to understand learning and flexibility at a deeper and yet more comprehensive level than previously. It also provides guidance for applications to helping people improve their learning and designing better processes in education and development. For those with an interest in learning organizations, it provides a theory and assessment methods for the inclusion of the study of individual differences while addressing learning at many levels in organizations and society.

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Table 1

Relations Between the Basic Learning Styles and Five Levels of Behavior.

Behavior level	Diverging	Assimilating	Converging	Accommodating
Personality types	Introverted Feeling	Introverted Intuition	Extraverted Thinking	Extraverted Sensation
Educational specialization	Arts, English History Psychology	Economics Mathematics Sociology Chemistry	Engineering Physical sciences	Business Management
Professional career	Social service Arts Communication	Sciences Research Information	Technology Economics Environment	Organizations Business
Current jobs	Personal jobs	Information jobs	Technical jobs	Executive jobs
Adaptive competencies	Valuing skills	Thinking skills	Decision skills	Action skills

Table 2

Early and Recent ELT/LSI Research by Academic Field and Publication.

ELT/LSI Research	Early Period (1971-1984)	Recent Period (1985-1999)	Total (1971-1999)
By Academic Field			
Education	165	251	416
Management	74	123	197
Computer Science	44	70	114
Psychology	23	78	101
Medicine	28	44	72
Nursing	12	51	63
Accounting	7	15	22
Law	1	4	5
Total	354	636	990
By Publication Type			
Journal Articles	157	378	535
Doctoral Dissertations	76	130	206
Books & Chapters	43	56	99
Other	78	72	150
Total	354	636	990

Data Source: Kolb & Kolb, 1999.

Table 3

Learning Modes and First, Second, and Third-Order Learning Styles.

Learning Styles	Developed Modes	Underdeveloped Modes
First-Order Learning Styles		
Diverging	CE, RO	AC, AE
Assimilating	AC, RO	CE, AE
Converging	AC, AE	CE, RO
Accommodating	CE, AE	AC, RO
Second-Order Learning Styles		
Northerner	CE, RO, AE	AC
Easterner	CE, AC, RO	AE
Westerner	CE, AC, AE	RO
Southerner	AC, RO, AE	CE
Third-Order Learning Styles		
Balanced Profiles	CE, AC, RO, AE	None

Notes: CE = Concrete Experience, AC = Abstract Conceptualization, RO = Reflective Observation, AE = Active Experimentation. For the spatial location of the four modes in the ELT learning cycle see Figure 1.

Figure 1

The Experiential Learning Cycle and Basic Learning Styles (Kolb, 1984).

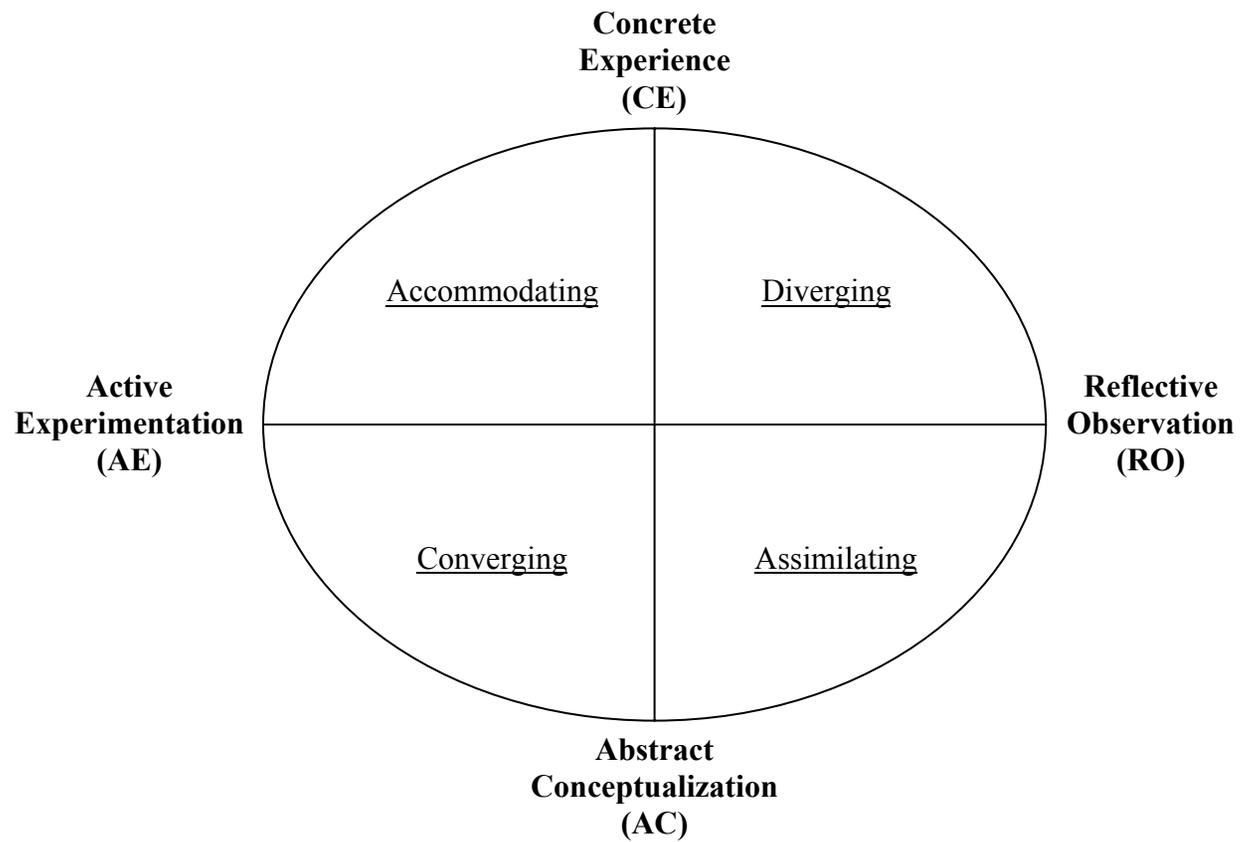


Figure 2

The Experiential Learning Theory of development (Kolb, 1984, p.141).