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Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education

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Experience-Based Learning Systems

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Drawing on the foundational theories of John Dewey and Kurt Lewin, we examine recent developments in theory and research on experiential learning and explore how this work can enhance experiential learning in higher education. We introduce the concept of learning space as a framework for understanding the interface between student learning styles and the institutional learning environment. We illustrate the use of the learning space framework in three case studies of longitudinal institutional development. Finally, we present principles for the enhancement of experiential learning in higher education and suggest how experiential learning can be applied throughout the educational environment by institutional development programs, including longitudinal outcome assessment, curriculum development, student development, and faculty development.

"(There is a) need of forming a theory of experience in order that education may be intelligently conducted upon the basis of experience."—John Dewey

"There is nothing so practical as a good theory."
—Kurt Lewin

Recent efforts to improve higher education, including reports from the National Research Council (Bransford, Brown, & Cocking 2000), the American Psychological Association (1997), and a number of other scholars (Baxter-Magolda, 1999; Boyatzis, Cowen, & Kolb 1995; Keeton, Sheckley, & Griggs 2002; King, 2003; Light, 2001; Mentkowski and Associates, 2000; Zull 2002) have focused on improving the learning process in education through the application of research from what has been called "the new science of learning" (Branford, Brown, & Cocking, 2000). One stream of this research is focused on the concept of experiential learning. Experiential learning is often misunderstood as a set of tools and techniques to provide learners with experiences from which they can learn. Others have used the term to describe learning that is a mindless recording of experience. Yet experiential learning is above all a philosophy of education based on what Dewey (1938) called a "theory of experience." He argued that while traditional education had little need for theory since practice was determined by tradition, the new experiential approach to education needed a sound theory of experience to guide its conduct. In this essay we examine the theory of experiential learning (Kolb, 1984) and related research to explore how this knowledge can be used to enhance learning in higher education.

We begin with a brief summary of experiential learning theory (ELT) and an overview of current research based on the theory. This is followed by the introduction of two new developments in ELT, a refinement in the assessment of experiential learning styles using the Learning Style Inventory (LSI) and the introduction of the concept of learning space as a framework for understanding the interface between student learning styles and the educational learning environment based on Lewin's concept of life space. Use of the learning space framework is illustrated in case studies of longitu-

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dinal institutional development in three diverse programs in higher education, the Cleveland Institute of Art, the Case Western Reserve University undergraduate program, and the Case Weatherhead School of Management MBA program. Finally, we present principles for the enhancement of experiential learning in higher education and suggest how experiential learning can be applied throughout the educational environment by institutional development programs that include longitudinal outcome assessment, curriculum development, student development, and faculty development.

EXPERIENTIAL LEARNING THEORY

Experiential learning theory draws on the work of prominent 20th century scholars who gave experience a central role in their theories of human learning and development—notably John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers and others—to develop a holistic model of the experiential learning process and a multilinear model of adult development (Kolb, 1984). The theory is built on six propositions that are shared by these scholars.

1. Learning is best conceived as a process, not in terms of outcomes. To improve learning in higher education, the primary focus should be on engaging students in a process that best enhances their learning—a process that includes feedback on the effectiveness of their learning efforts. As Dewey notes, "[E]ducation must be conceived as a continuing reconstruction of experience: . . . the process and goal of education are one and the same thing" (Dewey 1897: 79).

2. All learning is *re*learning. Learning is best facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested, and integrated with new, more refined ideas.

3. Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Conflict, differences, and disagreement are what drive the learning process. In the process of learning one is called upon to move back and forth between opposing modes of reflection and action and feeling and thinking.

4. Learning is a holistic process of adaptation to the world. Not just the result of cognition, learning involves the integrated functioning of the total person— thinking, feeling, perceiving, and behaving.

5. Learning results from synergetic transactions between the person and the environment. In Piaget's terms, learning occurs through equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts to new experience.

6. Learning is the process of creating knowledge. ELT proposes a constructivist theory of learning whereby social knowledge is created and recreated in the personal knowledge of the learner. This stands in contrast to the "transmission" model on which much current educational practice is based, where preexisting fixed ideas are transmitted to the learner.

ELT 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: 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). Experiential learning is a process of constructing knowledge that involves a creative tension among the four learning modes that is responsive to contextual demands. This process is portrayed 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. 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. In *The Art of Changing the Brain: Enriching Teaching by Exploring the Biology of Learning,* James Zull, a biologist and founding director of CWRU's University Center for Innovation in Teaching and Education (UCITE), sees a link between ELT and neuroscience research, suggesting that this process of experiential learning is related to the process of brain functioning (as shown in Fig. 1).

> Put into words, the figure illustrates that concrete experiences come through the sensory cortex, reflective observation involves the integrative cortex at the back, creating new abstract concepts occurs in the frontal integrative cortex, and active testing involves the motor brain. In other words, the learning cycle arises from the structure of the brain (Zull 2002: 18–19).

The concept of learning style describes individual differences in learning based on the learner's

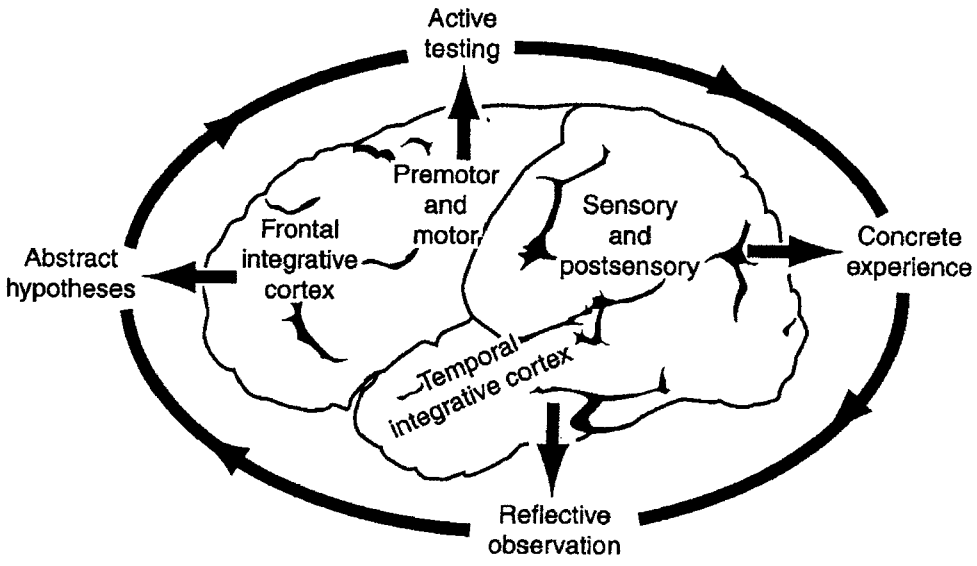

FIGURE 1
The Experiential Learning Cycle and Regions of the Cerebral Cortex. *Note.* Reprinted with permission from (Zull 2002).

preference for employing different phases of the learning cycle. Because of our hereditary equipment, our particular life experiences, and the demands of our present environment, we develop a preferred way of choosing among the four learning modes. We resolve the conflict between being concrete or abstract and between being active or reflective in patterned, characteristic ways.

ELT as defined by Kolb posits that learning is the major determinant of human development, and how individuals learn shapes the course of their personal development. His previous research has shown that learning styles are influenced by personality type, educational specialization, career choice, and current job role and tasks (Kolb, 1984). Yamazaki (2002, 2003) has recently identified cultural influences as well. The ELT developmental model (Kolb, 1984) defines three stages: (1) *acquisition,* from birth to adolescence, where basic abilities and cognitive structures develop; (2) *specialization,* from formal schooling through the early work and personal experiences of adulthood, where social, educational, and organizational socialization forces shape the development of a particular, specialized learning style; and (3) *integration* in midcareer and later life, where nondominant modes of learning are expressed in work and personal life. Development through these stages is characterized by increasing complexity and relativism in adapting to the world and by increased integration of the dialectic conflicts between AC and CE and AE and RO. Development is conceived as multilinear, based on an individual's particular learning style and life path—development of CE increases affective complexity, of RO increases perceptual complexity, of AC increases symbolic complexity, and of AE increases behavioral complexity.

RESEARCH ON EXPERIENTIAL LEARNING THEORY

ELT was developed following Lewin's plan for the creation of scientific knowledge by conceptualizing phenomena through formal, explicit, testable theory. In Lewin's approach, "before a system can be fully useful the concepts in it have to be defined in a way that (1) permits the treatment of both the qualitative and quantitative aspects of phenomena in a single system, (2) adequately represents the conditional-genetic (or causal) attributes of phenomena, (3) facilitates the measurement (or operational definition) of these attributes, and (4) allows both generalization to universal laws and concrete treatment of the individual case" (Cartwright, 1951: ix). A theory developed by this process can be a powerful instrument for stimulating and focusing scholarly research conversation.

Since its first statement in 1971 (Kolb, 1971; Kolb, Rubin, & McIntyre, 1971), there have been many studies using ELT to advance the theory and practice of experiential learning. The July 2005 update of the *Experiential Learning Theory Bibliography* (Kolb & Kolb, 2005) includes 1876 entries. Because ELT is a holistic theory of learning that identifies learning style differences among different aca-

demic specialties, it is not surprising to see that ELT research is highly interdisciplinary, addressing learning and educational issues in many fields. An analysis of the 1004 entries in the 1999 bibliography (Kolb, Boyatzis, & Mainemelis, 2001) shows 207 studies in management, 430 in education, 104 in information science, 101 in psychology, 72 in medicine, 63 in nursing, 22 in accounting and 5 in law. About 55% of this research has appeared in refereed journal articles, 20% in doctoral dissertations, 10% in books and book chapters, and 15% in conference proceedings, research reports, and other venues.

There have been two comprehensive reviews of the ELT literature, one qualitative and one quantitative. In 1991 Hickcox extensively reviewed the theoretical origins of ELT and qualitatively analyzed 81 studies that focused on the application of the ELT model as well as on the application of the concept of learning style in accounting and business education, helping professions, medical professions, postsecondary 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 LSI studies culled from 275 dissertations and 624 articles that were qualitative, theoretical, and quantitative studies of ELT and the Kolb Learning Style Inventory (LSI; Kolb 1971, 1985, 1999a; see also Hickox, 1991). Iliff 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 by way of meta-analysis. Most studies reported correlations that fell in the .2 to .5 range for the LSI scales. In conclusion Iliff suggested that the magnitude of these statistics is not sufficient to meet standards of predictive validity, while noting 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 a means for construct validation of ELT. 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 lifelong learning. Academic field and job classification studies viewed as a whole also show a pattern of results consistent with the ELT structure of knowledge theory.

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. 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 critical theory perspective, where the theory is seen as individualistic, cognitivist, and technological (e.g., Vince, 1998; Holman, Pavlica, & Thorpe, 1997; Hopkins, 1993). Kayes (2002) has reviewed these and other critics of ELT and offered his own critique of the critics. He suggests that critics have overlooked the role of Vygotsky's social-constructivist learning theory in the ELT theory of development and the role of personal knowledge and social knowledge in experiential learning. He proposes an extension of ELT based on Lacan's poststructuralist analysis that elaborates the fracture between personal and social knowledge and the role that language plays in shaping experience.

LEARNING STYLE ASSESSMENT

Much of the research on ELT has focused on the concept of learning style using the Learning Style Inventory (LSI) to assess individual learning styles (Kolb 1971, 1999a,b; see also Hickox, 1991). Although individuals tested on the LSI show many different patterns of scores, previous research with the instrument has identified four learning styles that are associated with different approaches to learning: diverging, assimilating, converging, and accommodating. 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).

An individual with diverging style has CE and RO as dominant learning abilities. People with this learning style are best at viewing concrete situations from many different points of view. The style 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. 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, to listen with an open mind, and to receive personalized feedback.

An individual with an assimilating style has AC and RO as dominant learning abilities. People with this learning style are best at understanding a wide range of information and putting it into concise, logical form. Individuals with an assimilating style are less focused on people and more interested in ideas and abstract concepts. Gener-

ally, 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.

An individual with a converging style has AC and AE as dominant learning abilities. 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 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.

An individual with an accommodating style has CE and AE as dominant learning abilities. People with this learning style have the ability to learn from primarily "hands-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.

Recent theoretical and empirical work is showing that the original four learning styles—assimilating, converging, accommodating, and diverging—can be expanded to show nine distinct styles. David Hunt and his associates (Abby, Hunt, & Weiser, 1985; Hunt 1987) identified four additional learning styles, which they identified as Northerner, Easterner, Southerner, and Westerner. The following descriptions of these styles include Hunt's analysis, which emphasizes the impact of the style's weakest learning mode on the learner's learning process.

The Northerner emphasizes feeling (CE) while balancing acting (AE) and reflecting (RO). The learning strengths of this style are a capacity for deep involvement while being comfortable in the outer world of action and the inner world of reflection. "This person has difficulty in conceptualizing or making meaning of experience; consequently, the cycle runs from feelings to reflection (which remains unconsolidated) to action. The consequence of this Northerly pattern is that the flow is discontinuous and the actions are poorly organized since they are not informed by the foundation of AC meaning" (Hunt, 1987: 155).

The Easterner emphasizes reflecting (RO) while balancing feeling (CE) and thinking (AC). The learning strengths of this style are a capacity for deep reflection informed by the ability to be both feeling oriented and conceptual. "Persons with an Easterly pattern have trouble putting plans into action. Consequently, they spend much time buried in thought. Because the action is short circuited, their thoughts are about their feelings rather than about their direct actions; this imbalanced cycle lacks the rejuvenation provided by actions" (Hunt, 1987: 155).

The Southerner emphasizes thinking (AC) while balancing acting (AE) and reflecting (RO). The learning strengths of this style are highly developed conceptual and analytic capabilities that are informed both by reflection and action. "Persons with a Southerly pattern are not in touch with their feelings. They reflect on the mechanics of their actions without benefit of emotional feedback. The reflection may lead to reformulation of concepts but the revision is mechanical and sterile" (Hunt, 1987: 155).

The Westerner emphasizes acting (AE) while balancing feeling (CE) and thinking (AC). The learning strengths of this style are highly developed action skills that are informed both by conceptual analysis and intuitive experience. "In this pattern, the Westerner goes directly from feelings to conceptualizing without sorting out the concrete experience. Consequently, the initial conceptual framework is likely to be unclear, with little possibility to correct it through reflection" (Hunt, 1987: 155).

A "Balancing" learning style has been identified by Mainemelis, Boyatzis, and Kolb (2002) that integrates AC and CE and AE and RO. In this study we employed the Learning Style Inventory (Kolb 1999a), the Adaptive Style Inventory (ASI, Boyatzis & Kolb 1993), and the Learning Skills Profile (LSP, Boyatzis & Kolb, 1991, 1995, 1997) to test a fundamental ELT hypothesis: The more balanced people are in their learning orientation on the LSI, the greater will be their adaptive flexibility on the ASI. To assess a balanced LSI profile, we used two indicators of a balanced learning profile, using absolute LSI scores on the Abstract/Concrete and Active/Reflective dimensions. The results sup-

ported our hypotheses, showing that people with balanced learning profiles in both dimensions of the LSI are more adaptively flexible learners as measured by the ASI. The relationship was stronger for the profile balanced on the Abstract/Concrete dimension than the Active/Reflective dimension. Other results showed that individuals with specialized LSI learning styles have a greater level of skill development in the commensurate skill quadrant of the LSP. The study also produced some unexpected results. For example, although we predicted that specialized learning styles would show less adaptive flexibility on the ASI, the results showed that this is true for the abstract learning styles but not for the concrete styles.

The nine learning styles outlined above can be defined by placing them on the learning style type grid (Kolb 1999a: 6). Instead of dividing the grid at the 50th percentiles of the LSI normative distributions for AC–CE and AE–RO, the nine styles are defined by dividing the two normative distributions into thirds. (On the AE–RO dimension the active regions are defined by raw scores ≥ 12, while the reflective regions are defined by raw scores ≤ -1. On the AC–CE dimension the concrete regions are defined by ≤ -1 and the abstract regions by ≥ 12. (See Fig 2.)

This research that increases the "resolution" of the learning style type grid from four to nine pixels may help to deal with a common misconception of ELT learning styles; that is, the tendency to treat the four learning styles as four categorical entities rather than continuous positions on the dimensions of AC–CE and AE–RO. Gould (2003) in his last book writes extensively about the bias in science that arises from such dichotomous thinking. Although the simple format of the LSI may limit empirical identification; theoretically, there are many identifiable learning styles along these two dimensions (not to mention other dimensions identified by other learning style theories). Elsewhere we have attempted to address this bias:

> When it is used in the simple, straightforward, and open way intended, the LSI usually provides an interesting self-examination and discussion that recognizes the uniqueness, complexity and variability in individual approaches to learning. The danger lies in the reification of learning styles into fixed traits, such that learning styles become stereotypes used to pigeonhole individuals and their behavior (Kolb, 1981: 290–291).

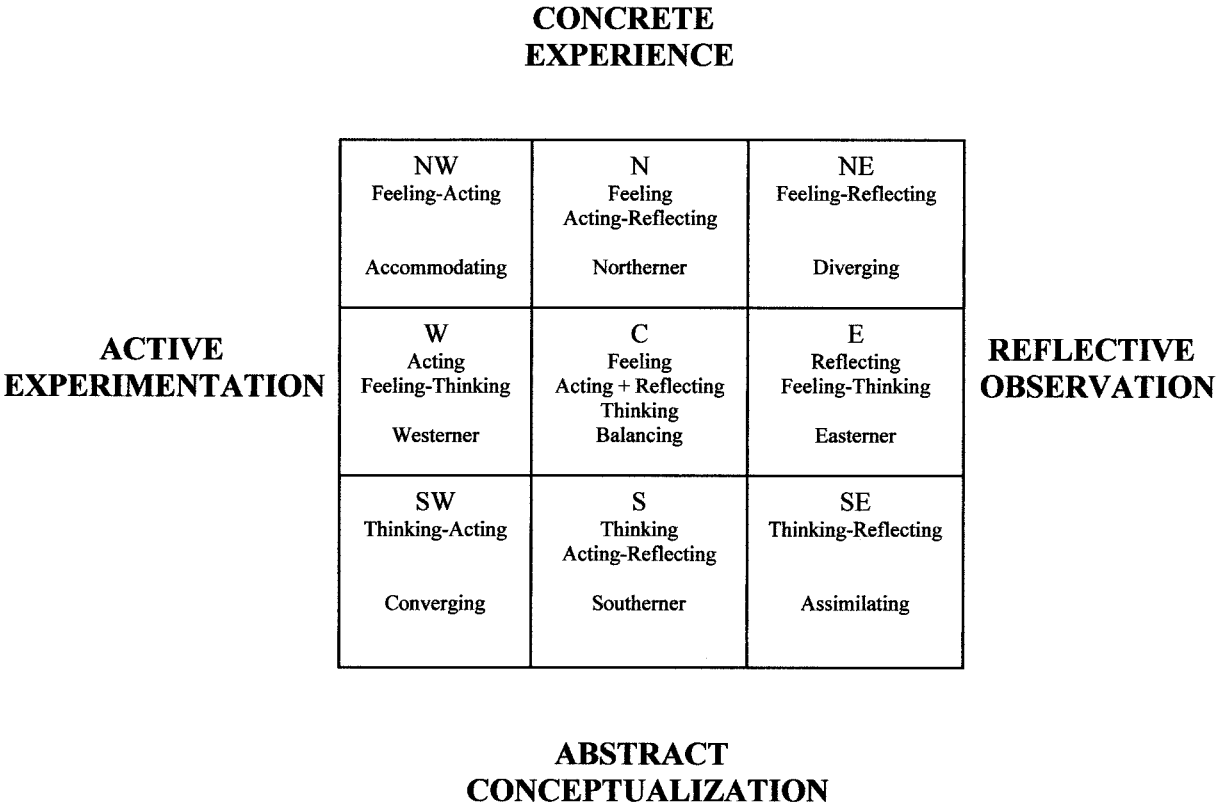

FIGURE 2
The Nine-Region Learning Style Type Grid

Is learning style a fixed trait or dynamic state? ELT clearly defines learning style as a dynamic state arising from an individual's preferential resolution of the dual dialectics of experiencing/conceptualizing and acting/reflecting.

> The stability and endurance of these states in individuals comes not solely from fixed genetic qualities or characteristics of human beings: nor, for that matter, does it come from the stable fixed demands of environmental circumstances. Rather, stable and enduring patterns of human individuality arise from consistent patterns of transaction between the individual and his or her environment . . . The way we process the possibilities of each new emerging event determines the range of choices and decisions we see. The choices and decisions we make to some extent determine the events we live through, and these events influence our future choices. Thus, people create themselves through the choice of actual occasions they live through (Kolb 1984: 63–64).

Nonetheless, in practice and research there is a marked tendency to treat learning style as a fixed personality trait (e.g., Garner, 2000). Individuals often refer to themselves and others as though learning style was a fixed characteristic: "I have trouble making decisions because I am a diverger." "He likes to work alone because he is an assimilator." To emphasize the dynamic nature of learning style, the latest version of the LSI has changed the style names from *diverger* to *diverging,* and so on.

LEARNING SPACE

To elaborate further the complex, dynamic nature of learning style and its formation through transactions between the person and environment we introduce the concept of *learning space*. The concept of learning space builds on Kurt Lewin's field theory and his concept of life space. For Lewin, both person and environment are interdependent variables, a concept Lewin translated into a mathematical formula, $B = f(p,e)$ where behavior is a function of person and environment. As Marrow puts it, "the life space is the total psychological environment which the person experiences subjectively" (1969: 35). Life space includes all facts which have existence for the person and excludes those which do not. It embraces needs, goals, unconscious influences, memories, beliefs, events of a political, economic, and social nature, and anything else that might have direct effect on behavior. The various factors in a given life space are to some degree interdependent, and Lewin strongly maintains that only the dynamic concepts of tension and force can deal with these sets of interdependent facts. This is what led him to define psychological needs as tension systems and their topological representation as vectors to denote motion. Lewin postulated that the particular organization of a person's life space was determined by a field of forces—both internal needs and external demands—that positioned the individual in a life space composed of different regions. Using map-like representation, the life space could be depicted topologically. Life spaces can vary in a number of dimensions, including extension, differentiation, integration, and level of conflict. Lewin introduced a number of concepts for analysis of the life space and a person's relationship to it that are applicable to the study of learning spaces, including position, region, locomotion, equilibrium of forces, positive and negative valence, barriers in the person and the world, conflict, and goal.

Three other theoretical frameworks inform the ELT concept of learning space. Urie Bronfrenbrenner's (1977, 1979) work on the ecology of human development has made significant sociological contributions to Lewin's life space concept. Bronfrenbrenner defines the ecology of learning/development spaces as a topologically nested arrangement of structures, each contained within the next. The learner's immediate setting, such as a course or classroom, is called the *microsystem,* while other concurrent settings in the person's life such as other courses, the dorm, or family are referred to as the *mesosystem*. The *exosystem* encompasses the formal and informal social structures that influence the person's immediate environment, such as institutional policies and procedures and campus culture. Finally, the *macrosystem* refers to the overarching institutional patterns and values of the wider culture, such as the cultural values favoring abstract knowledge over practical knowledge, that influence actors in the person's immediate microsystem and mesosystem. This theory provides a framework for analysis of the social system factors that influence learners' experience of their learning spaces.

Another important contribution to the learning space concept is situated learning theory (Lave & Wenger 1991). Like ELT, situated learning theory draws on Vygotsky's (1978) activity theory of social cognition for a conception of social knowledge that conceives of learning as a transaction between the person and the social environment. Situations in situated learning theory such as life space and

learning space are not necessarily physical places but constructs of the person's experience in the social environment. These situations are embedded in communities of practice that have a history, norms, tools, and traditions of practice. Knowledge resides not in the individual's head but in communities of practice. Learning is thus a process of becoming a member of a community of practice through legitimate peripheral participation (e.g., apprenticeship). Situated learning theory enriches the learning space concept by reminding us that learning spaces extend beyond the teacher and the classroom. They include socialization into a wider community of practice that involves membership, identity formation, transitioning from novice to expert through mentorship, and experience in the activities of the practice, as well as the reproduction and development of the community of practice itself as newcomers replace old-timers.

Finally, in their theory of knowledge creation, Nonaka and Konno (1998) introduce the Japanese concept of *ba,* a "context that harbors meaning," which is a shared space that is the foundation for knowledge creation. "Knowledge is embedded in *ba,* where it is then acquired through one's own experience or reflections on the experiences of others" (Nonaka & Konno, 1998: 40). Knowledge embedded in *ba* is tacit and can only be made explicit through sharing of feelings, thoughts, and experiences of persons in the space. For this to happen the *ba* space requires that individuals remove barriers between one another in a climate that emphasizes "care, love, trust, and commitment." Learning spaces similarly require norms of psychological safety, serious purpose, and respect to promote learning.

In ELT the experiential learning space is defined by the attracting and repelling forces (positive and negative valences) of the two poles of the dual dialectics of action/reflection and experiencing/conceptualizing, creating a two-dimensional map of the regions of the learning space. Individuals' learning style positions them in one of these regions depending on the equilibrium of forces among action, reflection, experiencing, and conceptualizing. As with the concept of life space, this position is determined by a combination of individual disposition and characteristics of the learning environment. The LSI measures an individual's preference for a particular region of the learning space, that individual's "home region" so to speak. Learners' scores on the LSI place them in one of the nine regions depicted in Figure 2, each of which is associated with a specific process of learning from experience. These regions are named for the points of the compass and are divided into specialized learning regions and integrative or balancing learning regions. The regions of the ELT learning space offer a typology of the different types of learning based on the extent to which they require action versus reflection, experiencing versus thinking, thereby emphasizing some stages of the learning cycle over others.

The learning process in specialized learning regions, accommodating, diverging, assimilating, and converging, strongly emphasizes one pole of the feeling/thinking dialectic and one pole of the acting/reflecting dialectic. Individuals in the NW region learn primarily through acting and feeling. In the NE region learners emphasize reflecting and feeling. In the SE region learners emphasize reflecting and thinking. In the SW region individuals learn through thinking and acting.

In the integrative learning regions, N, E, S, W, and C, the learning process integrates the poles of one or both of the two dialectics. The learning process in the N region integrates acting and reflecting with a primary emphasis on feeling. In the E region the learning process integrates feeling and thinking with a primary emphasis on reflecting. In the S region learners integrate acting and reflecting with a primary emphasis on thinking. In the W region the learning process integrates feeling and thinking with a primary emphasis on action. In the central region learners take an integrative approach to learning that balances feeling, thinking, acting, and reflecting.

The ELT learning space concept emphasizes that learning is not one universal process but a map of learning territories, a frame of reference within which many different ways of learning can flourish and interrelate. It is a holistic framework that orients the many different ways of learning to one another. As Lewin put it,

> Actually, the term learning refers to a multitude of different phenomena. The statement, "Democracy, one has to learn, autocracy is imposed on the person," refers to one type of learning. If one says that the spastic child has to learn to relax one is speaking of a different type of learning. Both types probably have very little to do with learning French vocabulary, and this type again has little to do with learning to like spinach. Have we any right to classify learning to high-jump, to get along with alcohol, and to be friendly with people under the same term, and to expect identical laws to hold for any of these processes? (Cited in Cartwright, 1951: 65).

Experiential learning can be viewed as a process of locomotion through the learning regions that is influenced by a person's position in the learning space. Research using the Adaptive Style Inventory (ASI; Boyatzis & Kolb, 1993) has shown that individuals vary in their ability to move about the learning space from their home region (e.g., a person scoring in the southern region moving from the thinking-oriented southern region to the feeling-oriented northern region) and that this capacity to adapt flexibly to changing learning contexts is related to higher stages of adult development (Kolb, 1984, chap. 8). One's position in the learning space defines that person's experience and thus defines their "reality". Lewin stresses the importance for education of defining the learning space in terms of the learner's experience:

> One of the basic characteristics of field theory in psychology, as I see it, is the demand that the field which influences an individual should be described not in objective physicalistic terms, but in the way that it exists for that person at that time . . . A teacher will never succeed in giving proper guidance to a child if he does not learn to understand the psychological world in which that child lives . . . To substitute for that world of the individual the world of the teacher, of the physicist, or of anybody else is to be, not objective, but wrong (Cited in Cartwright, 1951: 62).

LEARNING SPACES IN HIGHER EDUCATION

To illustrate the concept of learning space, we present data showing the distribution of student learning styles in three institutions of higher education that are engaged in longitudinal institutional development programs to promote learning: the Case Weatherhead School of Management MBA program, the Cleveland Institute of Art undergraduate program, and the Case Western Reserve University undergraduate program. The Case Weatherhead institutional development program, reported in *Innovation in Professional Education: Steps on a Journey From Teaching to Learning* (Boyatzis, Cowen, & Kolb 1995), focused on curriculum development, student development, and longitudinal outcome assessment (Boyatzis, Stubbs, & Taylor, 2002). MBA student learning style data is from Boyatzis and Mainemelis (2000). The program at the Cleveland Institute of Art is part of a longitudinal study of artistic learning conducted by the Ohio Consortium on Artistic learning involving a longitudinal study of artistic learning styles, student development workshops, and faculty development seminars (A. Kolb & Lingham 2002; Eickmann, A. Kolb, & D. Kolb, 2003). The Case program to enhance experiential learning in the undergraduate curriculum involves longitudinal outcome assessment, curriculum development, faculty development, and student development.

Comparing Learning Styles of Case Management and CIA Art Students

Figures 3 and 4 show how the learning styles of management and art students are distributed in the learning regions. Art students are concentrated in the feeling-oriented northern regions of the learning space, while management students are concentrated in the thinking-oriented southern regions. Forty-two point one percent of art students are in the northern regions, while 23.6% are in the south. Forty-five point seven percent of management students are in the southern regions with 21.2% in the north. More art students are in the eastern regions than in the western regions (35.2% to 26.3%). More management students are in the western regions than in the eastern regions (36.3% to 30.4%). Among art students the SW region is the least populated (3.7%), while the least-populated region for management students is the NE (5.1%). Ten point two percent of management students are in the balancing central region, while 12.5% of art students are there. Boyatzis and Mainemelis found significant correlations between abstract learning styles and grades and GMAT indicating a bias toward abstraction in evaluation and selection practices. For BFA graduates, there was no relationship between grades and learning style.

Comparing Learning Spaces in Management and the Arts

Our observations of the way the educational process is conducted in art schools and management schools reveal some striking differences that give insight into the nature of learning in the different learning regions. Dewey's distinction between artistic and scientific learning helps us understand the difference between the kinds of learning that occur in art education and in management education:

> The rhythm of loss of integration with environment and recovery of union not only persists in man, but becomes conscious with him; its conditions are material out of which he forms purposes. Emotion is the conscious sign of a break, actual or impending. The discord

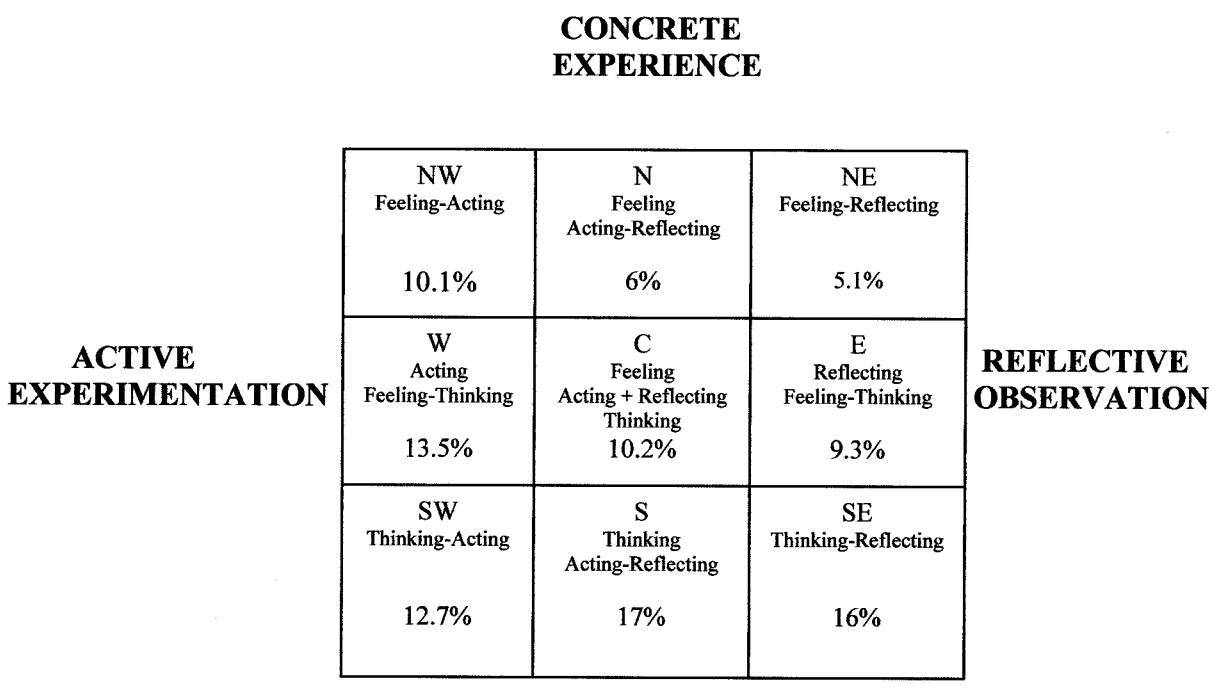

FIGURE 3
Learning Styles of MBA Students (*N* = 1286)

is the occasion that induces reflection. Desire for restoration of the union converts mere emotion into interest in objects as conditions of realization of harmony. With the realization, material of reflection is incorporated into objects as their meaning. Since the artist cares in a peculiar way for the phase of experience in which union is achieved, he does not shun moments of resistance and tension. He rather cultivates them, not for their own sake but because of their potentialities, bringing to living consciousness an experience that is unified and total. In contrast with the person whose purpose is esthetic, the scientific man is interested in problems, in situations wherein tension between the matter of observation and of thought is marked. Of course he cares for their resolution. But he does not rest in it; he passes on to another problem using an attained solution only as a stepping stone on which to set on foot further inquires.

The difference between the esthetic and the intellectual is thus one of the place where emphasis falls in the constant rhythm that marks the interaction of the live creature with his surroundings . . . Because of the comparative remoteness of his end, the scientific worker operates with symbols, words, and mathematical signs. The artist does his thinking in the very qualitative media he works in, and the terms lie so close to the object that he is producing that they merge directly into it (Dewey, 1934: 15–16).

A first awareness of differences in the management and arts learning spaces came as we were preparing a learning style workshop for art students. We asked what readings we should give and the provost, Paul Eickmann, said, "You know, for art students learning is not text driven." This stood in dramatic contrast with management education, which is almost entirely organized around texts that deliver an authoritative scientific discourse. The scientific basis of the management curriculum was established in 1959 by an influential Carnegie Foundation report that sought to improve the intellectual respectability of management education by grounding it in three scientific disciplines: economics, mathematics, and behavioral science.

The text-driven approach of management education contrasts with the experiential learning process of demonstration–practice–production–

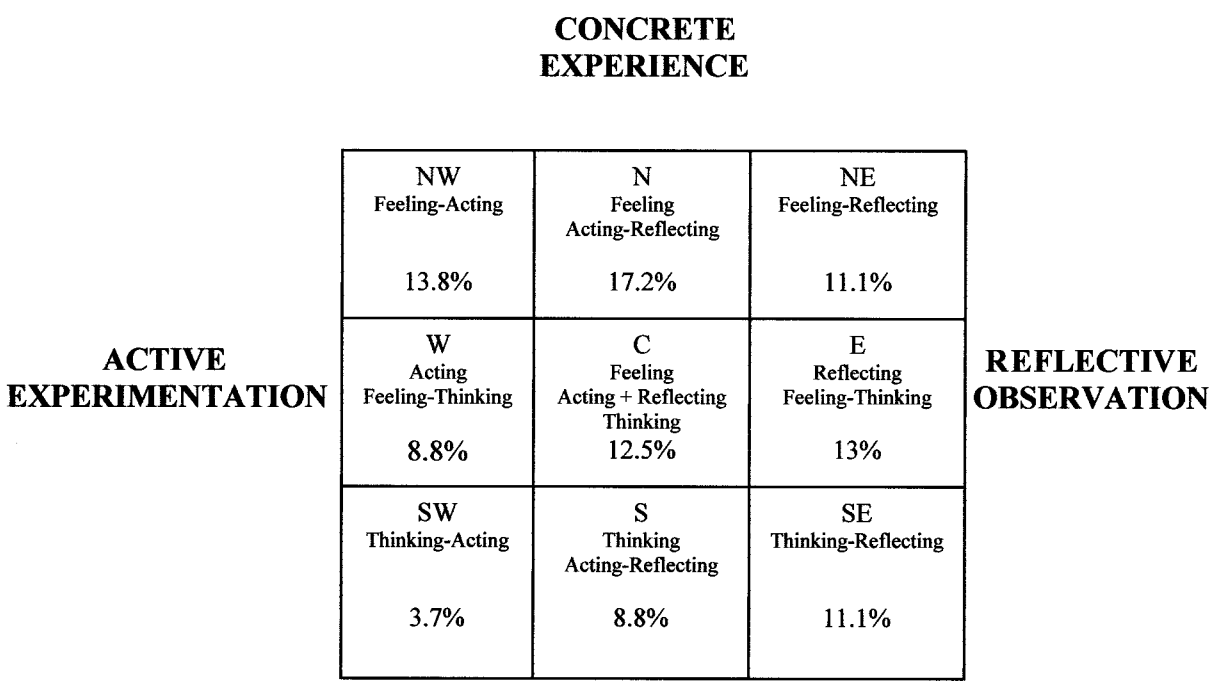

FIGURE 4
Learning Style Distribution of CIA Graduating Students (N = 216)

critique that is used in most art classes (see Table 1). This process is repeated recursively in art education, while management education is primarily discursive, with each topic covered in a linear sequence with little recursive repetition. Management education focuses on telling; art education emphasizes showing. Management education tends to emphasize theory; art education emphasizes integration of theory and practice. Art education focuses on the learners' inside-out expression; management education on outside-in impression. Most time in management classes is spent conveying information with relatively little time spent on student performance, most of which occurs on tests and papers. In art classes, the majority of the time is spent on student expression of ideas and skills. Art education tends to be individualized, with small classes and individual attention, while management education is organized into large classes with limited individualized attention. An assistant dean at the Columbus College of Art and Design who majored in music as an undergraduate and later got an MBA, contrasted the 3 hours a week he spent in individual tutorial with his mentor with the shock he experienced in entering a tiered MBA classroom of 200 students. Finally, art education tends to be represented by faculty members with diverse learning styles, whereas management education tends to favor specialized faculty members with a primarily abstract learning orientation.

TABLE 1
Comparison of Arts Education and Management Education

Arts Education	Management Education
Aesthetic	Scientific
Demo–practice–production–critique	Text driven
Recursive	Discursive
Theory and practice	Theory
Showing	Telling
Expression	Impression
Individualized	Batched
Diverse faculty	Abstract faculty

Longitudinal Locomotion in the Arts Learning Space

Longitudinal LSI scores from CIA students at the beginning of their freshman and junior years show a significant movement among students from the reflective eastern regions to the active western

regions, perhaps indicating student growth and development toward a more active role in their own learning as a result of the empowering, active structure of the CIA learning environment (see Table 2). Longitudinal studies of LSI changes among undergraduates in Alverno College's program, which emphasizes competency development through active experiential learning, show similar movement from the reflective to active learning regions across the freshman to senior years (Mentkowski & Strait 1983; Mentkowski and Associates, 2000).

Learning Styles of Case Undergraduates

Figure 5 shows the distribution of Case freshmen in the learning regions. As might be expected from a research university liberal arts program with a strong emphasis on science and engineering, the pattern of LSI scores shows a distribution across the learning regions that is similar to the Case MBA program in its emphasis on the abstract southern regions. Forty-nine percent of Case freshmen are positioned in the southern regions (vs. 47.5% MBAs) and 16.8% of the freshmen are in the northern regions (vs. 21.2% MBAs). As with the MBA students, there are significant correlations between abstract selection criteria, (SAT scores), and abstract LSI scores ($r = .32$). However, the Case freshmen are more similar to the CIA graduates in their distribution in the eastern and western regions. Thirty-five point five percent of Case freshmen are in the eastern regions (vs. 35.2% CIA). Twenty-three point three percent of Case freshmen are in the western regions (vs. 26.3% CIA). The NW is the least populated learning region (3.5%), while the S region has the greatest number of Case freshmen (19.4%).

Skill Development and Learning Regions

Table 3 shows the relationship between the position of Case freshmen in the learning regions and their learning skills as measured by the Learning Skills Profile. Five of the 12 learning skill areas show significant *F* values. All three conceptual skill areas, Theory Building, Quantitative Analysis, and Technology skills show significant differences among regions. Tukey and Scheffe tests indicate that theory skills are highest in the S and SW and lowest in the NE region. Quantitative analysis skills are highest in the S and lowest in the NW, N, and NE regions. Among the interpersonal skill areas, only help skills were significant across regions, with the NW significantly higher than the S region. In the action skills area, only initiative skills were significant with the NW area significantly higher than the E, SE, and C regions. None of the information skill areas were significant among regions.

Summary

The portraits of institutional learning spaces presented above suggest that student learning style scores may be a way to describe the institutional learning spaces experienced by students. In particular the comparison between the observed educational programs and teaching methods of CIA arts education and Case MBA education seems consistent with respective student LSI distributions in the nine-region learning space, with MBA students primarily in the southern thinking and western acting regions, and arts students falling mainly in the northern feeling and eastern reflection regions. The corresponding discursive, telling, educational methods of the MBA program and the recursive, showing, techniques of the art school

TABLE 2
CIA Students' Learning Style at the Beginning of the Freshman and Junior Year

		Freshman (2000)		Junior (2001)		
LSI Scores	***n***	***M***	***SD***	***M***	***SD***	t^a
Experiencing (CE)	77	26.31	6.07	26.87	6.64	−0.66
Reflecting (RO)	77	31.36	6.56	29.23	7.00	2.42**
Conceptualizing (AC)	77	28.88	6.28	29.34	7.47	−0.54
Acting (AE)	77	32.88	6.48	34.56	6.80	−1.95*
AC-CE	77	2.57	9.97	2.47	11.88	0.08
AE-RO	77	1.52	11.40	5.32	11.56	−2.61**

[a] Significance levels are for paired sample *t* tests as two-tailed tests.
* $p < .05$. ** $p < .01$.

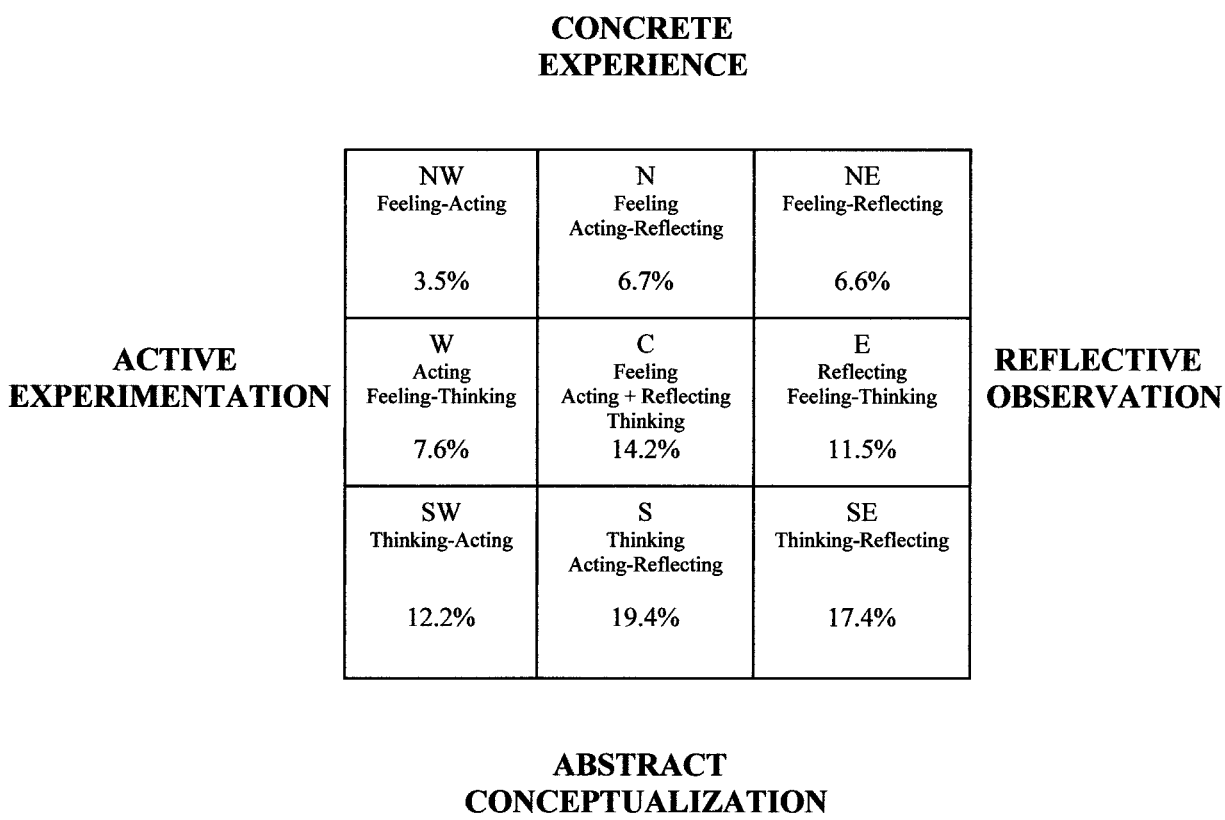

FIGURE 5
Case 2002 Undergraduate Freshman LSI Distribution (N = 288)

recall Dewey's description of the scientific worker who "operates with symbols, words and mathematical signs" and the artist who "does his thinking in the very qualitative media he works in."

The very similar learning space distributions of Case undergraduate and MBA students suggest the institutional exosystem influence of the university's research mission and culture on the learning spaces experienced by students. Both students and faculty are selected for their abstract learning skills, so it is not surprising that the university learning spaces would predominate in the southern regions.

As the undergraduate data on learning skills and learning regions suggest, the nine regions of the experiential learning space are associated with specific learning processes. The learning processes in each region are in turn most effective for the achievement of certain learning outcomes. For example, the feeling-oriented northern regions are most effective for learning interpersonal skills, while the thinking-oriented southern regions are most effective for learning analytic and quantitative skills. Individuals' learning styles represent their preferences for particular regions of the learning space, their *home bases* so to speak. That Case specializes in education for abstract, analytic skills makes sense in that its mission is to prepare students for careers that require abstraction and analysis. However, to learn skills outside of their home region, learners need to move to other regions and the learning process for any skill requires the ability to move through the experiencing, reflecting, thinking, and acting cycle. To fully develop the whole person requires an educational culture that promotes diverse learning spaces and locomotion among them.

CREATING LEARNING SPACES FOR THE ENHANCEMENT OF EXPERIENTIAL LEARNING

The enhancement of experiential learning in higher education can be achieved through the creation of learning spaces that promote growth-producing experiences for learners. A central concept in Dewey's educational philosophy is the *continuum of experience* in which experiences that promote or inhibit learning are arrayed. "The belief that all genuine education comes about through experience does not mean that all experiences are genuinely educative . . . For some experiences are mis-educative. Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience . . .

TABLE 3
Learning Skills of Case Freshman by Their Learning Space Region

	n	Leadership	Relationship	Help	Sensemaking	Information Gathering	Information Analysis	Theory Building	Quantitative Analysis	Technology	Goal Setting	Action	Initiative
Northwest	11	29.91	32.82	**32.09**	27.55	25.73	24.73	24.73	23.82	22.09	28.00	29.27	**33.09**
North	21	28.10	31.05	30.00	27.52	26.48	25.62	24.86	23.86	23.10	27.10	28.90	28.76
Northeast	19	28.00	30.84	30.42	27.16	25.21	25.58	23.53	24.16	21.89	28.37	29.26	29.79
East	33	26.18	30.33	29.18	26.48	24.00	25.64	25.79	27.24	21.73	26.88	27.27	27.76
Southeast	50	25.16	29.24	27.72	26.70	24.82	26.28	26.54	27.26	24.12	27.78	28.32	26.24
South	56	26.68	28.55	27.46	28.04	24.98	27.77	**28.27**	**28.77**	25.64	29.02	28.91	28.13
Southwest	35	27.23	29.86	27.91	28.51	25.57	28.14	**28.31**	28.20	25.57	30.00	29.51	29.77
West	22	30.09	31.91	30.68	26.82	25.55	26.68	25.73	25.18	21.23	28.09	29.36	29.36
Central	41	26.90	30.59	29.17	26.90	24.39	25.80	24.68	25.27	20.83	28.46	28.05	27.98
Between Groups *F*		1.82	1.78	2.24*	0.73	0.54	1.58	3.61**	3.95***	2.25*	1.45	0.61	2.87**

Post hoc tests, Tukey & Scheffe: The bold numbers represent larger means and underlined numbers, smaller means.
$p < .05$. ** $p < .01$. *** $p < .001$.

Hence the central problem of an education based on experience is to select the kind of present experiences that live fruitfully and creatively in subsequent experiences" (Dewey, 1938: 25–28). A number of educational principles flow from this philosophy.

Respect for Learners and Their Experience

A growth-producing experience in the philosophy of experiential learning refers not only to a direct experience related to a subject matter under study but also to the total experiential life space of the learner. This includes the learner's physical and social environment and quality of relationships. We refer to this as the cheers/jeers experiential continuum. At one end learners feel that they are members of a learning community who are known and respected by faculty and colleagues and whose experience is taken seriously, a space "where everybody knows your name." At the other extreme are "mis-educative" learning environments where learners feel alienated, alone, unrecognized, and devalued. Learning and growth in the jeers environment "where nobody knows your name" can be difficult if not impossible. While this principle may seem obvious or even "preachy," it is problematic for even the finest educational institutions. President Lawrence Summers of Harvard dedicated his 2003 commencement address to the introduction of a comprehensive examination of the undergraduate program, motivated in part by a letter he received from a top science student which contained the statement, "I am in the eighth semester of college and there is not a single science professor here who could identify me by name." Summers concludes: "The only true measure of a successful educational model is our students' experience of it" (Summers, 2003: 64).

Begin Learning With the Learner's Experience of the Subject Matter

To learn experientially learners must first of all own and value their experience. Students will often say, "But I don't have any experience," meaning that they don't believe that their experience is of any value to the teacher or for learning the subject matter at hand. The new science of learning (Bransford, Brown, & Cocking 2000) is based on the cognitive constructivist theories of Piaget and Vygotsky that emphasize that people construct new knowledge and understanding from what they already know and believe, based on their previous experience. Zull (2002) suggests that this prior knowledge exists in the brain as neuronal networks which cannot be erased by a teacher's cogent explanation. Instead the effective teacher builds on exploration of what students already know and believe, on the sense they have made of their previous concrete experiences. Beginning with these or related concrete experiences allows the learner to re-examine and modify their previous sensemaking in light of the new ideas.

Creating and Holding a Hospitable Space for Learning

To learn requires facing and embracing differences; whether they be differences between skilled expert performance and one's novice status, differences between deeply held ideas and beliefs and new ideas, or differences in the life experience and values of others that can lead to understanding them. These differences can be challenging and threatening, requiring a learning space that encourages the expression of differences and the psychological safety to support the learner in facing these challenges (Sanford, 1966). As Robert Kegan says, "people grow best where they continuously experience an ingenious blend of challenge and support" (1994: 42). As Kegan implies by his use of the term *ingenious blend,* creating and holding this learning space is not easy. He notes that while educational institutions have been quite successful in challenging students, they have been much less successful in providing support. One reason for this may be that challenges tend to be specific and immediate, while support must go beyond an immediate "You-can-do-it" statement. Creating and holding a learning space requires a climate or culture of support that the learner can trust to "hold" them over time. In *Conversational Learning* (Baker, Jensen, & Kolb, 2002), we draw on the works of Henri Nouwen (1975) and Parker Palmer (1983, 1990, 1998) to describe this challenging and supportive learning space as one that welcomes the stranger in a spirit of hospitality where "students and teachers can enter into a fearless communication with each other and allow their respective life experiences to be their primary and most valuable source of growth and maturation" (Nouwen, 1975: 60).

Making Space for Conversational Learning

Human beings naturally make meaning from their experiences through conversation. Yet genuine conversation in the traditional lecture classroom can be extremely restricted or nonexistent. At the break or end of the class the sometimes painfully silent classroom will suddenly come alive with

spontaneous conversation among students. Significant learning can occur in these conversations, although it may not always be the learning the teacher intended. Making space for good conversation as part of the educational process provides the opportunity for reflection on and meaning making about experiences that improve the effectiveness of experiential learning (Keeton, Sheckley, & Griggs 2002; Bunker 1999). For example, the creation of learning teams as part of a course promotes effective learning when psychologically safe conditions are present (Wyss-Flamm, 2002). *Conversational Learning* presents the dimensions of spaces that allow for good conversation. It is more likely to occur in spaces that integrate thinking and feeling, talking and listening, leadership and solidarity, recognition of individuality and relatedness, and discursive and recursive processes. When the conversational space is dominated by one extreme of these dimensions, for example, talking without listening, conversational learning is diminished.

Making Space for Development of Expertise

With vast knowledge bases in every field that are ever changing and growing, many higher education curricula consist of course after course "covering" a series of topics in a relatively superficial factual way. Yet as the National Research Council in its report on the new science of learning recommends on the basis of research on expert learners, effective learning requires not only factual knowledge, but the organization of these facts and ideas in a conceptual framework and the ability to retrieve knowledge for application and transfer to different contexts (Bransford, Brown, & Cocking 2000). Such deep learning is facilitated by deliberate, recursive practice on areas that are related to the learner's goals (Keeton, Sheckley, & Griggs 2002). The process of learning depicted in the experiential learning cycle describes this recursive spiral of knowledge development. Space needs to be created in curricula for students to pursue such deep experiential learning in order to develop expertise related to their life purpose.

Making Spaces for Acting and Reflecting

Learning is like breathing; it involves a taking in and processing of experience and a putting out or expression of what is learned. As Dewey noted, "nothing takes root in mind when there is no balance between doing and receiving. Some decisive action is needed in order to establish contact with the realities of the world and in order that impressions may be so related to facts that their value is tested and organized" (1934: 45). Yet many programs in higher education are much more focused on impressing information on the mind of the learner than on opportunities for the learners to express and test in action what they have learned. Many courses will spend 15 weeks requiring students to take in volumes of information and only a couple of hours expressing and testing their learning, often on a multiple-choice exam. This is in contrast to arts education built on the demonstration–practice–critique process where active expression and testing are continuously involved in the learning process. Zull (2002) suggests that action may be the most important part of the learning cycle because it closes the cycle by bringing the inside world of reflection and thought into contact with the outside world of experiences created by action (cf. Dewey, 1897). Keeton, Sheckley and Gross (2002) propose another level of action/reflection integration, emphasizing the importance of active reflection in deepening learning from experience.

Making Spaces for Feeling and Thinking

We have seen a polarization between feeling and thinking in the contrast between the feeling-oriented learning space of CIA arts education and the thinking-oriented learning spaces of the Case undergraduate and MBA programs. It seems that educational institutions tend to develop a learning culture that emphasizes the learning mode most related to their educational objectives and to devalue the opposite learning mode. Yet, Damasio (1994, 2003), LeDoux (1997), Zull (2002), and others offer convincing research evidence that reason and emotion are inextricably related in their influence on learning and memory. Indeed it appears that feelings and emotions have primacy in determining whether and what we learn. Negative emotions such as fear and anxiety can block learning, while positive feelings of attraction and interest may be essential for learning. To learn something that one is not interested in is extremely difficult.

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Making Space for Inside-Out Learning

David Hunt (1987, 1991) describes *inside-out learning* as a process of beginning with oneself in learning by

focusing on one's experienced knowledge, that is, the implicit theories, metaphors, interests, desires and goals that guide experience. Making space for inside-out learning by linking educational experiences to the learner's interests kindles intrinsic motivation and increases learning effectiveness. Under the proper educational conditions, a spark of intrinsic interest can be nurtured into a flame of committed life purpose (Dewey, 1897). Yet learning spaces that emphasize extrinsic reward can drive out intrinsically motivated learning (Deci & Ryan, 1985; Kohn 1993; Ryan & Deci, 2000). Long ago Dewey described the trend toward emphasis on extrinsic reward in education and the consequences for the teacher who wields the carrot and stick:

> Thus in education we have that systematic depreciation of interest which has been noted . . . Thus we have the spectacle of professional educators decrying appeal to interest while they uphold with great dignity the need of reliance upon examinations, marks, promotions and emotions, prizes and the time honored paraphernalia of rewards and punishments. The effect of this situation in crippling the teacher's sense of humor has not received the attention which it deserves (1916: 336).

Making Space for Learners to Take Charge of Their Own Learning

Many students enter higher education conditioned by their previous educational experiences to be passive recipients of what they are taught. Making space for students to take control of and responsibility for their learning can greatly enhance their ability to learn from experience. Some authors use the term *self-authorship* to describe this process of constructing one's own knowledge versus passively receiving knowledge from others, considering self-authorship to be a major aim of education (Kegan, 1994; King, 2003; Baxter-Magolda, 1999). Others describe this goal as increasing students' capacity for self-direction (Boyatzis, 1994; Robertson, 1988). The Management Development and Assessment course in the Case MBA program aims to develop student self-direction through assessment and feedback on learning skills and competencies and the development of a learning plan to achieve each student's career/life goals (Boyatzis, 1994). Bransford, Brown, and Cocking (2002) argue for the development of meta-cognitive skills to promote active learning. By developing their effectiveness as learners (Keeton, Sheckley, & Griggs, 2002), students can be empowered to take responsibility for their own learning by understanding how they learn best and the skills necessary to learn in regions that are uncomfortable for them. Workshops on experiential learning and learning styles can help students to develop meta-cognitive learning skills. At CIA and the Case undergraduate programs, student workshops help students interpret their LSI scores and understand how to use this information to improve their learning effectiveness. John Reese at the University of Denver Law School conducts "Connecting with the Professor" workshops in which students select one of four teaching styles based on the four predominant learning styles that they have difficulty connecting with. The workshop gives multiple examples of remedial actions that the learner may take to correct the misconnection created by differences in teaching and learning styles. Peer group discussions among law students give an opportunity to create new ideas about how to get the most from professors with different learning and teaching styles (Reese, 1998).

PROMOTING LEARNING IN HIGHER EDUCATION THROUGH INSTITUTIONAL DEVELOPMENT

To implement these educational learning space principles requires a holistic program of institutional development that includes curriculum development, faculty development, student development, administrative and staff development, and resource development. Programs in these areas need to be coordinated around an institutional vision and mission to promote learning. Such a coordinated institutional approach can provide the synergy necessary for dramatic organizational change, while fragmented approaches in one area are often frustrated by lack of interest or understanding in others. One can develop a state of the art learning-focused curriculum that is doomed to failure if faculty members are not on board with it philosophically and technically. If administrative leadership has priorities focused on income and ratings, the resources for learning promotion will not be available in other developmental areas.

By developing their effectiveness as learners (Keeton, Sheckley, & Griggs, 2002), students can be empowered to take responsibility for their own learning by understanding how they learn best and the skills necessary to learn in regions that are uncomfortable for them.

In the last chapter of *Innovation in Professional Education* titled "What if Learning Were the Purpose of Education" (Boyatzis, Cowen, & Kolb, 1995), we proposed five design principles to help educational institutions focus on the promotion of learning.

1. Evaluation of educational structures and processes against promotion of learning criteria.
2. Longitudinal outcome studies to determine learning value added.
3. Becoming a learner-centered institution.
4. Continuous research and inquiry about the learning process.
5. Becoming a learning organization through continuous stakeholder conversation.

The institutional development program to promote experiential learning initiated by Case Western Reserve University (Case) provides an example of this holistic approach. In October 2000 the Case president and provost created the President's Commission on Undergraduate Education and Life. The Commission's report recommended that Case adopt a philosophy of experiential learning, encapsulated in the mission/value statement that "CWRU graduates students who have discovered and are realizing their own uncommon potential through the University's uniquely transformative environment and its philosophy that education is best accomplished through experience" (President's Commission, 2001: 2). Building on the Commission report, university faculty developed an experimental undergraduate curriculum called Seminar Approach to General Education Studies (SAGES). The SAGES 2-year pilot program was created as part of curriculum revision of the undergraduate General Education Requirements (GER) of College of Arts and Sciences proposed by the commission. Following the proposed new GER recommendations, SAGES was designed to foster in students breadth as well as specialized knowledge by exposing them to a wide range of disciplines within three major divisions of the college: Natural Sciences and Mathematics, Arts and Humanities, and Social Sciences in addition to their major field of study. Such learning objectives are to be accomplished through a small class size (max 15 students), intense one-to-one advising, and exposure to diverse learning environments and teaching pedagogy across the university (A. Kolb et al., 2003). In 2002 the new president, Edward Hundert, embraced the Commission report, committed the funding to implement fully the SAGES curriculum beginning in the fall of 2005, and in his inaugural address, articulated a vision for the future of the university: "We're going to focus all of our collective talent, attention and resources on a vision—a vision that starts with a commitment to experiential learning with rigorous scholarship in undergraduate, graduate and professional education programs to produce educated learners—educated learners who are awake to new possibilities" (*Campus News,* 2003: 2).

To support the new SAGES curriculum, Case has launched a 5-year faculty development program to be organized and delivered through Center for Innovation in Teaching and Education (UCITE). According to the plan of this program, a total of 80 faculty members across the university will undergo an intense development on how to develop a particular course or other educational experiences based on experiential learning over the period of 5 years. In this program, faculty members meet regularly to discuss the philosophy of experiential learning, the methods of implementation that respond to the needs of the individual schools and departments, the course structure that needs to be put in place, the teaching methods that lend themselves to meeting the goals, and assessment techniques. In an effort to coordinate and support such university-wide institutional development initiatives, the new president created the Center for Institutional Research (CIR), a collaborative effort to expand institutional research support for all sectors of the university. Its primary role is to provide information about the university's students, faculty, staff, programs and environment to support decision making, policy analysis, institutional assessment, and strategic planning. The Case initiative to enhance experiential learning in the undergraduate curriculum integrating institutional development activities through a leadership vision serves as an example for the creation of educational learning spaces that promote learning in higher education.

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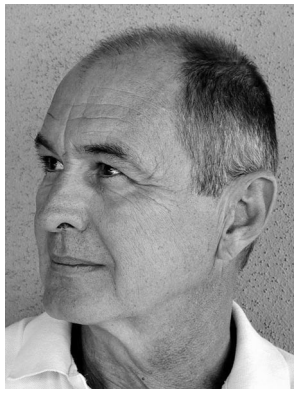

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