David A. Kolb

Management and the Learning Process

Today's highly successful manager or administrator is distinguished not so much by any single set of knowledge or skills but by his ability to adapt to and master the changing demands of his job and career—by his ability to learn. The same is true for successful organizations. Continuing success in a changing world requires an ability to explore new opportunities and learn from past successes and failures. These ideas are neither new nor particularly controversial. Yet it is surprising that this ability to learn, which is so widely regarded as important, receives so little explicit attention from managers and their organizations. There is a kind of fatalism about learning. One either learns or he doesn't. The ability to consciously control and manage the learning process is usually limited to such schoolboy maxims as "Study hard" and "Do your homework."

Part of the reason for this fatalism lies, I believe, in a lack of understanding about the learning process itself. If managers and administrators had a model about how individuals and organizations learn, they would better be able to enhance their own and their organizations' ability to learn. This article describes such a model and attempts to show some of the ways in which the learning process and individual learning styles affect management education, managerial decision making and problem solving, and organizational learning.

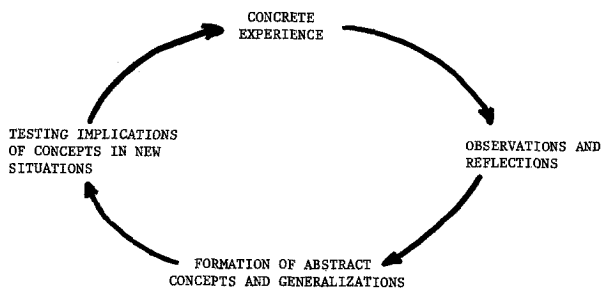
The Experiential Learning Model

Let us begin with a model of how people learn, which I call the experiential learning model. The model is labeled "experiential" for two reasons. The first is historical, tying it to its intellectual origins in the social psychology of Kurt Lewin in the 1940s and the sensitivity training and laboratory education work of the 1950s and 1960s. The second reason is to emphasize the important role that experience plays in the learning process, an emphasis that differentiates this approach from other cognitive theories of the learning process. The core of the model is a simple description of the learning cycle—how experience is translated into concepts, which in turn are used as guides in the choice of new experiences (Figure 1).

Learning is conceived of as a four-stage cycle. Immediate concrete experience is the basis for observation and reflection. These observations are assimilated into a theory from which new implications for action can be deduced. These implications or hypotheses then serve as guides in acting to create new experiences. The learner, if he is to be effective, needs four different kinds

Figure 1

The Experiential Learning Model



of abilities—*concrete experience* (CE), *reflective observation* (RO), *abstract conceptualization* (AC), and *active experimentation* (AE). That is, he must be able to involve himself fully, openly, and without bias in new experiences (CE); he must be able to reflect on and observe these experiences from many perspectives (RO); he must be able to create concepts that integrate his observations into logically sound theories (AC); and he must be able to use these theories to make decisions and solve problems (AE).

Yet how difficult this ideal is to achieve! Can anyone become highly skilled in all of these abilities, or are they necessarily in conflict? How can one act and reflect at the same time? How can one be concrete and immediate and still be theoretical? Indeed, a closer examination of the four-stage learning model reveals that learning requires abilities that are polar opposites and that the learner, as a result, must continually choose which set of learning abilities he will bring to bear in any specific learning situation.

More specifically, there are two primary dimensions to the learning process. The first dimension represents the concrete experiencing of events at one end and abstract conceptualization at the other. The other dimension has active experimentation at one extreme and reflective observation at the other. Thus, in the process of learning one moves in varying degrees from actor to observer, from specific involvement to general analytic detachment.

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Most cognitive psychologists see the concrete/abstract dimension as a primary dimension on which cognitive growth and learning occurs.[1-4] Goldstein and Scheerer suggest that greater abstractness results in the development of the following abilities: to detach our ego from the outer world or from inner experience; to assume a mental set; to account for acts to oneself, to verbalize the account; to shift reflectively from one aspect of the situation to another; to hold in mind simultaneously various aspects; to grasp the essential of a given whole—to break up a given into parts to isolate and synthesize them; to abstract common properties reflectively, to form hierarchic concepts; to plan ahead ideationally, to assume an attitude toward the more possible, and to think or perform symbolically.[5] Concreteness, on the other hand, represents the absence of these abilities, the immersion in and domination by one's immediate experiences.

Yet as the circular model of the learning process would imply, abstractness is not exclusively good and concreteness exclusively bad. To be creative requires that one be able to experience anew, freed somewhat from the constraints of previous abstract concepts. In psychoanalytic theory this need for a concrete, childlike perspective in the creative process is referred to as regression in service of the ego.[6] In his essay on the conditions for creativity, Bruner further emphasizes the dialectic tension between abstract detachment and concrete involvement.[2] For him the creative act is a product of detachment and commitment, of passion and decorum, and of a freedom to be dominated by the object of one's inquiry.

The active/reflective dimension is the other major dimension of cognitive growth and learning. As growth occurs, thought becomes more reflective and internalized, based more on the manipulation of symbols and images than covert actions. The modes of active experimentation and reflection, like abstractness/concreteness, stand in opposition to one another. Reflection tends to inhibit action and vice versa. For example, Singer has found that children who have active internal fantasy lives are more capable of inhibiting action for long periods of time than are children with little internal fantasy life.[7] Kagan has found, on the other hand, that very active orientations toward learning situations in-

hibit reflection and thereby preclude the development of analytic concepts.[8] Herein lies the second major dialectic in the learning process—the tension between actively testing the implications of one's hypotheses and reflectively interpreting data already collected.

Individual Learning Styles

As a result of our hereditary equipment, our particular past life experience, and the demands of our present environment most people develop learning styles that emphasize some learning abilities over others. We come to resolve the conflicts between being active and reflective and between being immediate and analytical in characteristic ways. Some people develop minds that excel at assimilating disparate facts into coherent theories, yet these same people are incapable of or uninterested in deducing hypotheses from their theories. Others are logical geniuses but find it impossible to involve and surrender themselves to an experience, and so on. A mathematician may come to place great emphasis on abstract concepts, while a poet may value concrete experience more highly. A manager may be primarily concerned with the active application of ideas, while a naturalist may develop his observational skills highly. Each of us in a unique way develops a learning style that has some weak and some strong points.

For some time now I have been involved in a program of research studies aimed at identifying different kinds of learning styles and their consequences. The purpose of this research is to better understand the different ways that people learn and solve problems so that we can both make individuals aware of the consequences of their own learning style and of the alternative learning modes available to them, and improve the design of learning experiences to take into account these learning-style differences. In this work we have developed a simple self-description inventory, the Learning Style Inventory (LSI), which is designed to measure an individual's strengths and weaknesses as a learner. The LSI measures an individual's relative emphasis on the four learning abilities described earlier, concrete experience (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE) by asking him, several different times, to rank in order four words that describe these different abilities. For example, one set of four words is "feeling" (CE), "watching" (RO), "thinking" (AC), and "doing" (AE). The inventory yields six scores, CE, RO, AC, and AE plus two combination scores that indicate the extent to which the individual emphasizes abstractness over concreteness (AC-CE) and active experimentation over reflection (AE-RO).

The LSI was administered to 800 practicing managers and graduate students in management to obtain a norm for the management population. In general these managers tended to emphasize active experimentation over reflective observation. In addition, managers with graduate degrees tended to rate their abstract learning skills higher.[9,10] While the managers we tested showed many different patterns of scores on the LSI, we have identified four dominant types of learning styles that occur most frequently. We have called these four styles the converger, the diverger, assimilator, and accommodator. (The reason that there are four dominant styles is that AC and CE are highly negatively correlated as are RO and AE. Thus individuals who score high on both AC and CE or on both AE and RO occur with less frequency than do the other four combinations of LSI scores.)

The converger's dominant learning abilities are AC and AE. His greatest strength lies in the practical application of ideas. We have called this learning style the converger because a person with this style seems to do best in situations such as conventional intelligence tests, where there is a single correct answer or solution to a question or problem.[11] His knowledge is organized in such a way that, through hypothetical-deductive reasoning, he can focus it on specific problems. Hudson's research on this style of learning shows that convergers are relatively unemotional, preferring to deal with things rather than people.[12] They tend to have narrow technical interests and choose to specialize in the physical sciences. Our research shows that this learning style is characteristic of many engineers.

The diverger has the opposite learning strengths of the converger. He is best at CE and RO. His greatest strength lies in his imaginative ability. He excels in the ability to view concrete situations from many perspectives. We have labeled this style diverger because a person with this style performs better in situations that call for

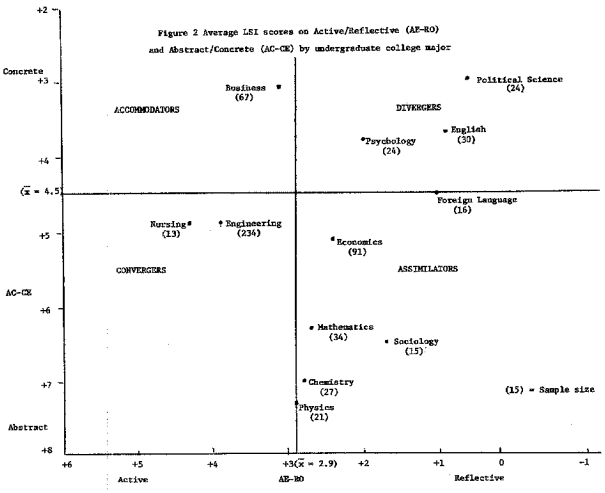
generation of ideas such as a "brainstorming" session. Hudson's work on this learning style shows that divergers are interested in people and tend to be imaginative and emotional.[12] They have broad cultural interests and tend to specialize in the arts. Our research shows that this style is characteristic of managers from humanities and liberal arts backgrounds. Personnel managers tend to be characterized by this learning style.

The assimilator's dominant learning abilities are AC and RO. His greatest strength lies in his ability to create theoretical models. He excels in inductive reasoning—in assimilating disparate observations into an integrated explanation. He, like the converger, is less interested in people and more concerned for abstract concepts, but he is less concerned with the practical use of theories. For him it is more important that the theory be logically sound and precise. As a result, this learning style is more characteristic of the basic sciences rather than the applied sciences. In organizations this learning style is found most often in the research and planning departments.

The accommodator has the opposite learning strengths of the assimilator. He is best at CE and AE. His greatest strength lies in doing things, in carrying out plans and experiments and involving himself in new experiences. He tends to be more of a risk taker than people with the other three learning styles. We have labeled this style accommodator because he tends to excel in situations where he must adapt himself to specific immediate circumstances. In situations where the theory or plans do not fit the facts, he will most likely discard the plan or theory. (His opposite style type, the assimilator, would be more likely to disregard or reexamine the facts.) The accommodator is at ease with people but is sometimes seen as impatient and "pushy." His educational background is often in technical or practical fields such as business. In organizations people with this learning style are found in action-oriented jobs, often in marketing or sales.

These different learning styles can be illustrated graphically (Figure 2) by plotting the average LSI scores for managers in our sample who reported their undergraduate college major (only those majors with more than ten people responding are included). Before interpreting these data, some cautions are in order. First, it should be remembered that all of the individuals in the sample are managers or managers-to-be. In addition, most of these men have completed or are in graduate school. These two facts should produce learning styles that are somewhat more active and abstract than the population at large (as indicated by total sample mean scores on AC-CE and AE-RO, +4.5 and +2.9 respectively).

The interaction between career, high level of education, and undergraduate major may produce distinctive learning styles. For example, physicists who are not in industry may be somewhat more reflective than those in this sample. Second, undergraduate majors are described only in the most general terms. There are many forms of engineering or psychology. A business major at one school can be quite different than that at another. However, even if we take these cautions into consideration, the distribution of undergraduate majors on the learning style grid is strikingly consistent with theory.[9] Undergraduate business majors tend to have accommodative learning styles, while engineers on the average fall in the convergent quadrant. History, English, political science, and psychology majors all have divergent learning styles, along with economics and sociology. Physics majors are very abstract, falling between the convergent and assimilative quadrants. What these data show is that one's undergraduate education is a major factor in the development of his learning style. Whether this is because individuals' learning styles are shaped by the fields they enter or because of selection processes that put people into and out of disciplines is an open question at this point. Most probably both factors are operating—people choose fields that are consistent with their learning styles and are further shaped to fit the learning norms of their field once they are in it. When there is a mismatch between the field's learning norms and the individual's learning style, people will either change or leave the field. Plovnick's research indicates that the latter alternative is more likely the case.[13] He studied a major university physics department and concluded that the major emphasis in physics education was on convergent learning. He predicted that physics students who had convergent learning styles would be content with their majors, whereas physics majors who were divergent in their learning style would be uncertain of



physics as a career and would take more courses outside of the physics department than their convergent colleagues. His predictions were confirmed. Those students who are not "fitted" for the convergent learning style required in physics tend to turn away from physics as profession.

These results pose something of an educational dilemma for the physics department. To contribute in physics today one must know many facts, so learning content is important; and this takes time, time that might be spent developing the convergent skills of divergers. So isn't it simpler to select (implicitly or explicitly) people who already possess these convergent experimental and theoretical skills? Perhaps, but in the process the creative tension between convergence and divergence is lost. The result of this process may be a program that produces fine technicians but few innovators.

Kuhn put the issue this way, "Because the old must be revalued and reordered when assimilating the new, discovery and invention in the sciences are usually intrinsically revolutionary. Therefore they do demand just that flexibility and open-mindedness that characterize and indeed define the divergent."[14] It just may be that one of the reasons why creative contributions in the sciences are made primarily by younger men is that the learning styles of older men have been shaped by their professional training and experience so that they adapt well to the inquiry norms of their profession, but the creative tension is lost.[15]

Learning Styles and Management Education

Differences in learning style create similar problems for management education. The manager who comes to the university for mid-career education experiences something of a culture shock. Fresh from a world of time deadlines and concrete, specific problems that he must solve, he is suddenly immersed in a strange, slow-paced world of generalities where the elegant solution to problems is sought even when workable solutions have been found. One gets rewarded here for reflection and analysis rather than concrete, goal-directed action. The manager who "acts before he thinks—if he ever thinks" meets the scientist who "thinks before he acts—if he ever acts."

Our research on learning styles has shown that managers on the whole are distinguished by very strong active experimentation skills and are very weak on reflective observation skills. Business school faculty members usually have the reverse profile. To bridge this gap in learning styles the management educator must somehow respond to pragmatic demands for relevance and the application of knowledge while encouraging the reflective examination of experience that is necessary to refine old theories and to build new ones. In encouraging reflective observation the teacher often is seen as an interrupter of action —as a passive, "ivory tower" thinker. Indeed, this is a critical role to be played in the learning process. Yet if the reflective observer role is not internalized by the students themselves, the learning process can degenerate into a value conflict between teacher and student, each maintaining that his is the right perspective for learning.

Neither the faculty nor student perspective alone is valid, in my view. Managerial education will not be improved by eliminating theoretical analysis or relevant case problems. Improvement will come through *integration of the scholarly and practical learning styles.* My approach to achieving this integration has been to apply directly the experiential learning model in the classroom.[10] To do this we created a workbook providing games, role plays, and exercises (concrete experiences) that focus on fifteen central concepts in organizational psychology. These simulations provide a common experiential starting point for managers and faculty to explore the relevance of psychological concepts for their work. In traditional management education

methods the conflict between scholar and practitioner learning styles is exaggerated because the material to be taught is filtered through the learning style of the faculty member in his lectures or his presentation and analysis of cases. The student is "one down" in his own analysis because his data are second-hand and already biased.

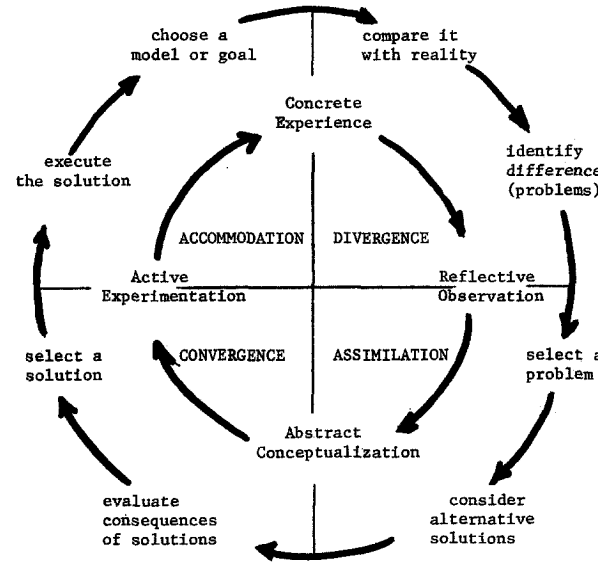
In the experiential learning approach this filtering process does not take place because both teacher and student are observers of immediate experiences, which they both interpret according to their own learning styles. In this approach the teacher's role is that of a facilitator of a learning process that is basically self-directed. He helps students to experience in a personal and immediate way the phenomena in his field of specialization. He provides observational schemes and perspectives from which to observe these experiences. He stands ready with alternative theories and concepts as the student attempts to assimilate his observations into his own conception of reality. He assists in deducing the implications of the student's concepts and in designing new experiments to test these implications through practical, "real world" experience.

There are two goals in the experiential learning process. One is to learn the specifics of a particular subject. The other goal is to learn about one's own strengths and weaknesses as a learner—learning how to learn from experience. When the process works well, managers finish their educational experience not only with new intellectual insights, but also with an understanding of their own learning style. This understanding of learning strengths and weaknesses helps in the application of what has been learned and provides a framework for continuing learning on the job. Day-to-day experience becomes a focus for testing and exploring new ideas. Learning is no longer a special activity reserved for the classroom; it becomes an integral and explicit part of work itself.

Learning Styles and Managerial Problem Solving

We have been able to identify relationships between a manager's learning style and his educational experiences, but how about his current behavior on the job? Do managers with different learning styles approach problem solving and

Figure 3 Comparison of the experiential Learning Model with a typical model of the problem solving process (after Pounds 1965)



decision making differently? Theoretically, the answer to this question should be yes, since learning and problem solving are not different processes but the same basic process of adaptation viewed from different perspectives. To illustrate this point I have overlaid in Figure 3 a typical model of the problem-solving process on the experiential learning model.[16] In this figure we can see that the stages in a problem-solving sequence generally correspond to the learning-style strengths of the four major learning styles described previously. The accommodator's problem-solving strengths lie in executing solutions and initiating problem finding based on some goal or model about how things should be. The diverger's problem-solving strengths lie in identifying the multitude of possible problems and opportunities that exist in reality ("compare model with reality and identify differences"). The assimilator excels in the abstract model building that is necessary to choose a priority problem and alternative solutions. The converger's strengths lie in the evaluation of solution consequences and solution selection.

To date, two studies have been conducted to discover whether there is anything to this theoretical model. The first study was conducted by Stabell in the trust department of a large Midwestern bank.[17] One aim of his study was to

discover how the learning styles of investment portfolio managers affected their problem solving and decision making in the management of the assets in their portfolios. While his study involved only thirty-one managers, he found a strong correspondence between the type of decisions these managers faced and their learning styles. More specifically, he found that nearly all of the managers in the investment advisory section of the department, a high-risk, high-pressure job (as indicated by a large percentage of holdings in common stock, a large percentage of discretionary accounts, and a high performance and risk orientation on the part of clients) had accommodative learning styles (scoring very high on the AE and CE LSI scales). On the other hand, the men in the personal trust section, where risk and performance orientations were low and there were few discretionary accounts and fewer holdings in common stock, scored highest on reflective observation. This finding supports our earlier analysis that high-pressure management jobs develop and select for active experimentation learning skills and inhibit reflective observation learning skills.

Stabell was interested in whether he could identify differences, on the basis of their LSI scores, in the way managers went about making investment decisions. He focused his research on differences between managers with CE learning skills and AC learning skills. He asked these managers to evaluate the importance of the information sources they used in making decisions and found several interesting differences. First, CE managers cited more people as important sources (colleagues, brokers, and traders), while the AC managers listed more analytically oriented printed material as sources (economic analyses, industry and company reviews). In addition, it seemed that CE managers sought services that would give them a specific recommendation that they could accept or reject (a potential list), while the AC managers sought information they could analyze themselves in order to choose an investment. This analytic orientation of the AC managers is further illustrated by the fact that they tended to use more information sources in their decisions than the CE managers. These data fit well with the learning/problem solving model in Figure 3. The concrete managers prefer go/no go implementation decisions based on personal recommendations, while the abstract managers prefer to consider and evaluate alternative solutions themselves.

The second study of the relationship between learning styles and managerial problem solving was a laboratory computer simulation of a production "trouble-shooting" problem where the problem solver had to determine which specific type of "widget" was failure-prone. This experiment, which is a modification of an earlier problem-solving experiment by Bruner and associates,[18] was conducted by Grochow as part of his doctoral dissertation.[19] His subjects for the experiment were twenty-two middle-level managers at MIT's Sloan Fellows program. Grochow was particularly interested in the different types of problem-solving strategies that assimilators and accommodators would use to solve this problem. He predicted that the accommodators would use a strategy that called for little complexity in use and interpretation, little inference from the data, and little cognitive strain in assimilating information, while assimilators would prefer a strategy that had the opposite characteristics—more complex use and interpretation and more assimilation strain and required inference. The former strategy, called successive scanning, was simply a process whereby the problem solver scans the data base of widgets for a direct test of his current hypothesis. It requires little conceptual analysis, since the current hypothesis is either validated or not in each trial. The latter strategy, called simultaneous scanning, is in a sense an optimal strategy in that each data point is used to eliminate the maximum number of data points still possible. This strategy requires considerable conceptual analysis, since the problem solver must keep several hypotheses in his head at the same time and deduce the optimal widget to examine in order to test these hypotheses.

The results of Grochow's experiment confirmed his hypothesis that accommodators would use successive scanning, while assimilators would use the more analytical simultaneous scanning strategy. He further found that managers with accommodative learning styles tended to show more inconsistency in their use of strategies, while the assimilative managers were quite consistent in their use of the simultaneous scanning

strategy. The accommodative managers seemed to be taking a more intuitive approach, switching strategies as they gathered more data during the experiment. Interestingly, Grochow found no differences between accommodative and assimilative managers in the amount of time it took them to solve the problem. Though the two groups used very different styles, in this problem they performed equally well.

The results of both of these studies are consistent with the learning/problem-solving model. Managers' learning styles are measurably related to the way in which they solve problems and make decisions on the job and in the laboratory.

The Organization as a Learning System

Like individuals, organizations learn and develop distinctive learning styles. They do so through their transactions with the environment and through their choice of how to relate to that environment. This has come to be known as the "open systems" view of organizations. Since many organizations are large and complex, the environment they relate to becomes highly differentiated and diverse. The way the organization adapts to this external environment is to differentiate itself into units, each of which deals with just one part of the firm's external conditions. Marketing and sales face problems associated with the market, customers, and competitors. Research deals with the academic and technological worlds. Production deals with production equipment and raw materials sources. Personnel and labor relations deal with the labor market, and so on.

Because of this need to relate to different aspects of the environment, the different units of the firm develop characteristic ways of thinking and working together, different styles of decision making and problem solving. These units select and shape managers to solve problems and make decisions in the way their environment demands. In fact, Lawrence and Lorsch define organizational differentiation as "the difference in cognitive and emotional orientation among managers in different functional departments."[20]

If the organization is thought of as a learning system, then each of the differentiated units that is charged with adapting to the challenges of one segment of the environment can be thought of as having a characteristic learning style that is best suited to meet those environmental demands. The LSI should be a useful tool for measuring this organizational differentiation among the functional units of a firm. To test this we studied approximately twenty managers from each of five functional groups in a Midwestern division of a large American industrial corporation.[21] The five functional groups are described below, followed by my hypothesis about the learning style that should characterize each group given the environments to which they relate.

1. Marketing (n=20). This group is primarily former salesmen. They have a nonquantitative, intuitive approach to their work. Because of their practical sales orientation in meeting customer demands, they should have accommodative learning styles—concrete and active.
2. Research (n=22). The work of this group is split about evenly between pioneer research and applied research projects. The emphasis is on basic research. Researchers should be the most assimilative group—abstract and reflective, a style fitted to the world of knowledge and ideas.
3. Personnel/Labor Relations (n=20). In this company men from this department serve two primary functions, interpreting personnel policy and promoting interaction among groups to reduce conflict and disagreement. Because of their people orientation these men should be predominantly divergers, concrete and reflective.
4. Engineering (n=18). This group is made up primarily of design engineers who are quite production oriented. They should be the most convergent subgroup—abstract and active—although they should be less abstract than the research group. They represent a bridge between thought and action.
5. Finance (n=20). This group has a strong computer/information-systems bias. Finance men, given their orientation toward the mathematical task of information-system design, should be highly abstract. Their crucial role in organizational survival should produce an active orientation. Thus, finance group members should have convergent learning styles.

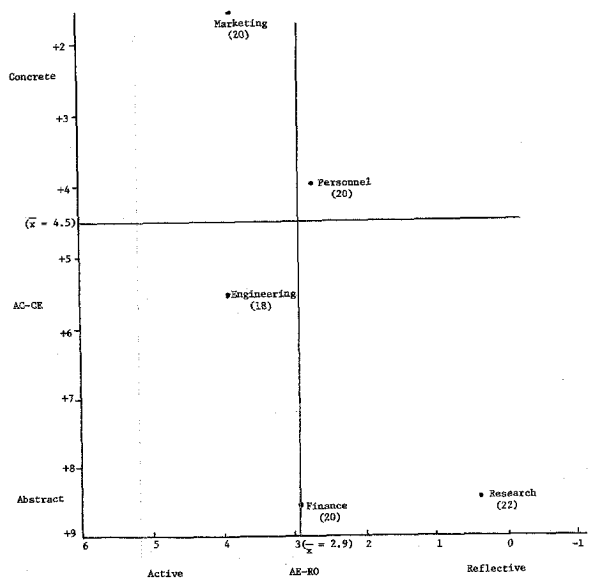


Figure 4 Average LSI scores on Active Reflective (AE-RO) and Abstract/Concrete (AC-CE) by Organizational Function

Figure 4 shows the average scores on the active/reflective (AE-RO) and abstract/concrete (AC-CE) learning dimensions for the five functional groups. These results are consistent with the above predictions with the exception of the finance group, whose scores are less active than predicted; thus, they fall between the assimilative and the convergent quadrant.[21] The LSI clearly differentiates the learning styles that characterize the functional units of at least this one company. Managers in each of these units apparently use very different styles in doing their jobs.

But differentiation is only part of the story of organizational adaptation and effectiveness. The result of the differentiation necessary to adapt to the external environment is the creation of a corresponding internal need to integrate and coordinate the different units. This necessitates resolving in some ways the conflicts inherent in these different learning styles. In actual practice this conflict gets resolved in many ways. Sometimes it is resolved through confrontation and integration of the different learning styles. More often, however, it is resolved through dominance by one unit over the other units, resulting in an unbalanced organizational learning style. We all know of organizations that are controlled by the marketing department or are heavily engineering-oriented, and so forth. This imbalance can be effective if it matches environmental demands in a stable environment; but it can be costly if the organization is called upon to learn to respond to changing environmental demands and opportunities.

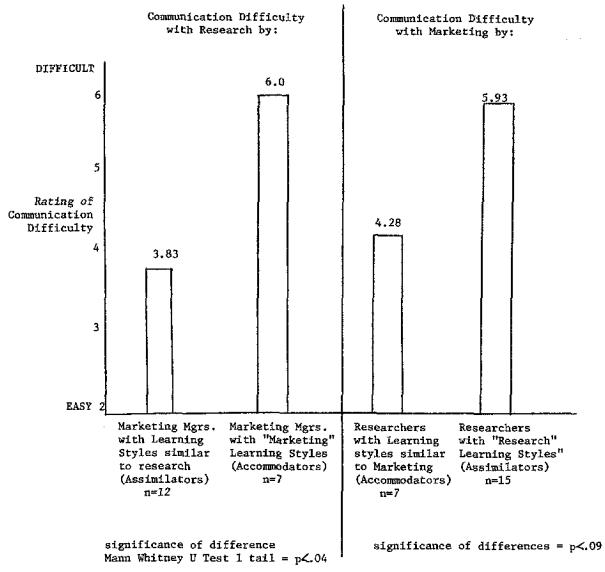
One important question concerns the extent to which the integrative conflict between units is a function of managers' learning styles rather than merely a matter of conflicting job and role demands. To get at this question we asked the managers in each of the five functional units in the preceding study to rate how difficult they found it to communicate with each of the other four units. If integrative communication is a function of learning style, there should be a correspondence between how similar two units are in their learning style and how easy they find it to communicate. When the average communication difficulty ratings among the five units are compared with differences in unit learning styles, we find that in most cases this hypothesis is confirmed—those units that are most different in learning style have most difficulty communicating with one another.[21]

To test this notion more rigorously we did a more intensive study of communication between the two units that were most different in learning styles, marketing and research. To ascertain whether it was the manager's learning style that accounted for communication difficulty we divided managers in the marketing unit into two groups. One group had learning styles that were similar to those managers in research (assimilators), while the other group had accommodative learning styles typical of the marketing function. The research group was divided similarly. The results of this analysis are shown in Figure 5. When managers have learning styles similar to another group they have little trouble communicating with that group. When style differences are great, communication difficulty rises. These results suggest that managers' learning styles are an important factor to consider in achieving integration among functional units.

Managing the Learning Process

To conclude, let us return to the problem we began with—how managers and organizations can explicitly manage their learning process. We have seen that the experiential learning model is useful not only for examining the educational process but also for understanding managerial problem solving and organizational adaptation.

Figure 5 Communication difficulty between Marketing and Research as a function of Learning Style



But how can an awareness of the experiential learning model and our own individual learning style help improve individual and organizational learning? Two recommendations seem important.

First, learning should be an explicit objective that is pursued as consciously and deliberately as profit or productivity. Managers and organizations should budget time to specifically learn from their experiences. When important meetings are held or important decisions made, time should be set aside to critique and learn from these events. In my experience all too few organizations have a climate that allows for free exploration of such questions as, What have we learned from this venture? Usually active experimentation norms dictate—We don't have time; let's move on.

Which leads to the second recommendation. The nature of the learning process is such that opposing perspectives, action and reflection, concrete involvement and analytical detachment, are all essential for optimal learning. When one perspective comes to dominate others, learning effectiveness is reduced in the long run. From this we can conclude that the most effective learning systems are those that can tolerate differences in perspective.

This point can be illustrated by the case of an electronics firm that I have worked with over the years. The firm was started by a group of engineers with a unique product. For several years they had no competitors and when some competition entered the market they continued to dominate and do well because of their superior engineering quality. Today is a different story. They are now faced with stiff competition in their original product area. In addition, their very success has caused new problems. They are no longer a small, intimate company but a large organization with several plants in the U.S. and Europe. The company has had great difficulty in responding to these changes because it still responds to problems primarily from an engineering point of view. Most of the top executives in the company are former engineers with no formal management training. Many of the specialists in marketing, finance, and personnel who have been brought in to help the organization solve its new problems feel like second-class citizens. Their ideas just don't seem to carry much weight. What was once the organization's strength—its engineering expertise—has become to some extent its weakness. Because engineering has flourished at the expense of the development of other organizational functions, such as marketing and the management of human resources, the firm is today struggling with rather than mastering its environment.

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22. "t" tests for significance of difference between groups on the abstract/concrete dimension yield the following one-tail probabilities that are less than 0.10. Marketing is more concrete than personnel ($p < 0.10$), engineering ($p < 0.05$), research ($p < 0.005$), and finance ($p < 0.005$). Finance and research are more abstract than personnel (on both comparisons $p < 0.005$). On the active/reflective dimension, research is more reflective than marketing ($p < 0.05$), engineering ($p < 0.05$), and to a lesser extent finance ($p < 0.10$).