

What Does It Take To Be A Lifelong Learner?

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I accept the conventional wisdom that we must all develop the aptitudes and dispositions of lifelong learning if we are to thrive in our dynamic and pluralistic age. My questions are, What precisely are those attitudes and dispositions, and how might they be developed? I will consider these questions in a specific context, which is only one of many important perspectives that need to be considered in developing a comprehensive answer, but believe that the discussion has general relevance for other ages and settings.

It is clear that the most formative stage for learning is the years immediately after birth, and the experiences of this young age provide the foundation for all that follows. Therefore, if we truly intend to develop the skills and habits of lifelong learning this is first and foremost where we should focus our attention. Much has been learned and more remains to be discovered about the effect of innate abilities and early learning on subsequent development. However, this age of unequalled opportunity lies behind us as adults and thus, while it influences the development of lifelong learning in essential ways, it will not be considered in this discussion.

The second most important phase in the development of individual potential is formal schooling, which establishes the attitudes and patterns of behavior that launch us into and guide us through the more independent years of learning outside of formal educational programs and settings. There is much that can, and should, be said about the impact of formal schooling on lifelong learning skills and dispositions, and how our approach to formal schooling should change in recognition of what we know about learning and are coming to appreciate about the challenge/opportunity of postmodern life. The focus of this chapter, however, will be on lifelong learning in work life after formal schooling is complete.

Knowledge work is increasingly the source of wealth for society and an essential aspect of the work of every organization. Thus, the creation and application of knowledge is a core issue for those organizations and the individuals within them. Understanding what is required at the individual level requires a consideration of what we know about learning, and particularly what is meant by lifelong learning. Understanding what is required at the organizational level requires a consideration of what we mean by knowledge, and particularly how usable knowledge is created in an organization. This chapter will consider the former issue, lifelong learning, with particular attention to knowledge work, and will touch on organizational issues only as necessary to provide the context. It is organized around three key questions. Why is lifelong learning important? What must be learned? How is it learned?

Why Is Lifelong Learning Important?

Both individual and organizational perspectives are important in considering this question, and either could serve as a starting point for considering this question. I will begin with a utilitarian consideration of organizational interests. Individual perspectives and processes will arise out of that discussion.

All organizations seek to sustain themselves, and most endeavour to grow. In either case, given the dynamic social, political and economic environment, it is essential for them to adapt continuously in order to avoid drifting into irrelevance or inefficiency, which would threaten their viability. This ongoing adaptation, or re-creation, requires learning. This is true of all organizations, but it is doubly true of educational institutions, whether grade schools or post-secondary schools, which are learning organizations in the sense of their function and should, therefore, also be learning organizations in terms of their form and conduct.

The preeminence of learning in determining organizational stability and growth is a relatively new phenomenon. In the Industrial Era, it was ownership of resources and investment in machinery which fuelled productivity and generated wealth for a society. In the Information Age, however, intellectual capital has become primary. The most important asset, the critical means of production, is the knowledge and skill of the work force. In fact, the “work force” has now generally become a “skill force” and, to an increasing degree, a “think force.” Thus, while resources and equipment continue to be important, they are not sufficient. It is the creation and application of ideas that fuels productivity.

The fact that ideas are the primary source of productivity creates a new dynamism because ideas are more volatile than things. Whereas resources may wax and wane over aeons, or at least decades, and machinery may evolve over years, ideas arise virtually instantaneously, and they can be discarded just as quickly. Even collective ideas, social consensus and conventional wisdom, can change dramatically in very short periods of time. Thus, continuous individual and collective learning—which is the metaphorical equivalent of stewardship of resources, or the maintenance and upgrading of machinery—becomes essential for organizational health and effectiveness.

This change from Industrial Era to Information Age, from work force to skill force, from physical labor to knowledge work as the fundamental social and economic engine, has profound implications for virtually everything. Not very long ago the typical worker was unskilled or semi-skilled and work was divided into fairly routine chunks which were then logically structured within a hierarchical organization to accomplish a task. Now, even the lowest jobs in many organizations require much higher levels of skill, and the people doing those jobs are expected to act with independence, and to be adaptive and creative. Bridges (1994) goes so far as to suggest that the idea of a job, defined as a stable set of tasks requiring specific knowledge and skills, is vanishing. The world of work is being transformed from a complex structure of defined tasks into a fluid field of challenges and opportunities. This change requires many individuals to reconceptualize their career in entrepreneurial terms, and many organizations to break out of traditional hierarchical bureaucratic structures because “a wave of job-free workers intent on doing what needs to be

done rather than on doing their jobs would wreck most traditional organizations.” (Bridges 1994, 68).

In this “white-water” world of continuous innovation and rapid, unpredictable change, not only must organizations become flatter and more fluid, but they must also develop new styles of management and leadership. Rational analysis and strategic planning cannot be relied upon as much as they might in the past. When the future cannot be predicted, the only option is to invent it yourself. Otherwise, you are left in a permanent state of reaction, constantly chasing after rather than managing, or directing, change. This creates a whole new culture of continuous assessment, abandonment and innovation; in short, re-creation, or learning, at the organizational level. In order for organizations to adapt to the new realities of knowledge work, it is necessary but not sufficient for them to re-structure. They must also un-structure and develop the ability to improvise on the fly.

This learning cannot come exclusively, or even primarily, from training programs which are designed and implemented by the organization in order to teach its members what it thinks are important understandings and skills. Although such training programs may well be useful, or even essential, they will also always be somewhat out of date by the time they are planned and implemented, and they will necessarily focus on what is known rather than what is yet to come. They will, therefore, always be insufficient to the learning task. In order to keep up with rapid change, deal with novel situations, and invent the organization’s future, the individuals that comprise the organization must be able to learn on their own as they go and to change their behavior on the basis of what they are learning, and un-learning. Training programs can help, but it is also essential for individuals in the organization to take responsibility for, and have the capacity to, learn on the job and to continuously re-create themselves and their organizations in a manner which has been described as “surfing” the wave of change in order to avoid being swamped by it.

It is important for educators at all levels to be lifelong learners not only because education, like other fields of work, is evolving rapidly in terms of the understandings of learning that are emerging, the range of learners’ needs that must be met, the quality of learning which is expected of all students, and the technology being used, but also because teachers cannot inculcate the skills and dispositions of lifelong learning in their students unless they themselves model those behaviors. They must become the change they want to see in their students, teaching by example as well as by explanation, by deeds as well as by words.

What Must Be Learned?

Once again, both individual and organizational perspectives must be considered in answering this question. I will begin with the organization.

Information Age knowledge workers should not be constrained by rigid procedures or regulations, but that does mean that they do not require organizations and the structure they provide. In order to accomplish complex tasks they must work together, and this implies the need for collaborative relationships, albeit somewhat more fluid and permissive than in the past. As knowledge workers participate in organizations, they both shape, and are shaped by,

them. Thus, individual and group learning are interdependent. Stacey (1996, 41) describes this as follows.

Group processes are thoughts and behaviors that are driven by a group schema and that in turn affect individual thinking and behaving. Thus, manipulations of the symbols that make up the shared schema affect manipulations in the unique schema of each individual ... Whole patterns of group behavior are continuously re-created by interactions between group members, and these group wholes in turn affect the interactions between members.

Stacey sees organizations as “complex adaptive structures,” which is an organic worldview that is in stark contrast to the mechanical assumptions of the traditional hierarchical bureaucracy. Whereas bureaucratic organizations treated individual competence and learning as discrete in the same way that individual jobs were considered discrete, in the flattened organizations and multi-functional teams that characterize the knowledge work of the Information Age, individual and organizational learning must be seen systemically as an irreducibly interconnected ecology. In fact, in the learning organization the “intelligence” and “competence” of a group may be determined as much by the nature of its working relationships as it is by individual understandings and skills.

Thus, not only must the individuals in the organization learn (i.e., develop new neurological connections and thought patterns), but so too must the organization (i.e., develop new structures and processes). New structures must be constantly created to accommodate new processes. Once created, neither can be allowed to settle into routine use, but must be constantly re-examined and refined. Structures which no longer function well become not only unproductive but an active impediment to progress, and must be dismantled. This imperative for constant growth, pruning and re-creation presents a fundamental challenge to organizations because it threatens the stability with which their members are familiar, and which many may even believe they require.

Not only are organizational structures and processes constantly changing, but the structures and processes themselves must have a different character. In order to create the space and potential for adaptation, which is essential to continued viability, they must provide support without restricting movement. In the study of organizations as complex adaptive systems, learning is seen to occur in the interface between structure and chaos. A delicate and dynamic balance is required between embrace and release, constructing and dismantling, learning and *un*-learning. The ability to dwell with this paradox and withstand the anxiety which it creates is essential to organizational learning, because only in the space between structure and chaos does it become possible to reconsider and reconstruct assumptions in order to create new understandings and thus achieve the double-loop learning described by Argyris and Schön.

The same is true for individuals. They must understand that in knowledge work, which is a major concern of any organization nowadays and thus an important part of any career, predictability and stability can be dangerous. The familiar all too easily becomes the comfortable, and the comfortable can become the routine, which is static and thus often harmful. In dynamic environments learning comes not from resolving ambiguity and paradox to re-establish a comforting stability, but from living with it and endlessly

rearranging it as necessary for action in the moment. In situations which call for continuous creativity, innovation and improvisation, if you are not a part of the solution, that is if you are not constantly learning, you are a part of the problem.

In order to learn, one must forsake the security of the familiar and voluntarily enter unknown territory in which errors fuel new insights and reconsideration of existing understandings. The trick is to do so at appropriate times, in appropriate ways and to an appropriate degree, so as to stimulate continuous learning without undue costs. Anyone who is attempting to remain current with the explosive development of the internet will know the importance, the elusiveness, the power, the danger, the exhilaration and the frustration of this boundary space between the known and the unknown. There is a continuous stream of new browsers, new protocols, new plug-ins and new sites which must be explored and adapted. One is always on the brink of the next great leap and there is no time to rest comfortably on one's past experiences or successes. Each new development is obsolete virtually instantly.

And what is it that individuals must learn in order to keep pace with all this change and to enable them to invent their future, or at least to recognize it when it comes along? A typical taxonomy of learning objectives is knowledge, skills and attitudes, but in many situations it is the knowledge aspect which predominates, and thus learning is essentially reduced to the accumulation of information. It is clear, however, that mere possession of information, or *declarative knowledge*, is in itself of little value. The knowledge must be applied, operationalized, in order to be useful. It must become usable, *procedural knowledge*, and even that is only useful in relatively stable situations in which knowledge is applied in predictable ways. When knowledge is to be used in new and changing contexts, it is essential to develop not only procedural knowledge but also *generative knowledge* or *understanding*; that is, the ability to work with novel situations and to extend one's understandings on the basis of that experience.

Even a sophisticated understanding of something like the internet is, however, not sufficient to use it productively. One also requires a range of skills, from the physical skill of typing to the analytical skill of designing logical searches to find what you require, and the evaluative skill to decide, once you have found it, what is useful information and what is false or irrelevant. Thinking skills are, then, essential in order to appreciate and apply that information, and unless you are working alone you will also require a range of social and interpersonal skills to work together with other people in designing those applications.

Generative knowledge, combined with the intellectual ability to adapt and apply it, can lead to useful results. Adding social skills so that one can work together with others amplifies that ability significantly, but it is still not sufficient to thrive in the new world of electronic networking. One must also be persistently and pervasively curious and have the motivation and tenacity to continuously pursue new understandings and avoid the pitfalls of complacency. This constant questing requires not only mental energy and drive but a degree of intellectual courage and emotional resilience in order to withstand constant change and high levels of ambiguity and unpredictability; not only in understandings but also in values since change creates new possibilities and with them new questions. In order to keep up with, and be at peace with, rapidly emerging technologies such as the internet or genetic engineering, the most important thing one needs to learn is *how* to learn, and not only to *like* it but to *live* it.

In knowledge work, learning is never finished. One may obtain certification in some area but one is never fully “educated,” never completely “competent,” never done learning. Lifelong learning is a continuous process of re-creation—re-creation of understandings, re-creation of behaviors and re-creation of self-concepts—through retrospective reflection-*on*-action and real-time reflection-*in*-action. This process is not simply a matter of acquiring new elements of knowledge and ability. We not only learn but we also forget, and sometimes we come to realize that things which we thought we had understood we had actually misconstrued and must therefore intentionally reframe or discard. Thus, learning occurs not only at the leading edge of an expanding zone of experience and expertise but also well within the zone of our presumed understanding and competence. In some cases this remembering may be simply a matter of bringing forgotten concepts back into the foreground of our attention, while in other cases it may also involve reconsideration and possibly reconstruction of what we already know in ways which deepen our understandings or create new connections between things which we had previously known but not related.

This is something one seldom learns in school, or in workshops. In fact, most schools and most workshops tend to teach quite the opposite. They deal in old knowledge and they seek to ensure fidelity to that knowledge. Vaill (1996, 21) decries this “institutional” model of compliant replicative learning and defines learning in a new way, not as knowledge acquired or even skills demonstrated, but as “changes a person makes in himself or herself that increase the know-why and/or the know-what and/or the know-how the person possesses with respect to a given subject.” He suggests that learning understood in this way—as changes a person makes in himself or herself—is encumbered by any inclination to suppress questions and uncertainties, or to avoid error by sticking to what is known or has already been mastered. In fact, for Vaill, lifelong learning involves certain habits of mind that make learning not so much a task to be undertaken as “a way of being.” The habits of mind that Vaill contends are fundamental to lifelong learning are:

- Curiosity - sustained inquiry and wonder
- Insight - awareness of unstated assumptions
- Honesty - commitment to seeing things, including one’s self, as they really are
- Courage - ability to permit ambiguity, acknowledge paradox, and initiate change
- Optimism - inclination to anticipate positive outcomes

Some may feel that these traits are established through a combination of nature and nurture in childhood and become essentially immutable by the time one is an adult, but Kegan (1982) describes research which shows that the adult “self” also evolves and that both behavior and personality can continue to change throughout our lifetime; that is, that we can learn to think and act differently at any age.

So, what have we determined so far that it is necessary to learn in order to thrive as a knowledge worker who surfs the wave of change in our Information Age? The list of things to be learned is broad but rather unstructured. The familiar triad of knowledge, skills and attitudes does not quite seem to capture it completely, even if one expands on the attitudinal dimension of this taxonomy to include the attributes of disposition and character that Vaill finds to be fundamentally important.

Ruohotie and Koiranen (Chapter 2 in this volume), making reference to work by Snow, Corno & Jackson, provide a more encompassing taxonomy of personal attributes in their consideration of entrepreneurship education. This taxonomy is based on the constructs of cognition, affection and conation.

Cognition is a general term for those processes that help an organism to recognize and obtain information about a certain object. Cognitive constructs include the following concepts: perceiving, recognizing, conceiving, judging and reasoning. *Affection* is the feeling response to a certain object or idea. Sometimes it also means the energy resulting from an emotion or a general reaction to something that one likes or dislikes. Affective constructs include feeling, emotion, mood, and temperament. *Conation* refers to those mental processes which help an organism to develop. It is a kind of intrinsic unrest (the opposite of intrinsic balance, or homeostasis) or a conscious tendency to act or strive for something. Conative constructs include impulse, desire, volition, and purposive striving. (pp. 29-30, this volume)

The important addition here to the common cognitive-affective distinction is the construct of conation, which may be subdivided into two parts: motivation and volition. Motivation is primarily concerned with an individual's pre-decisional state—that is, with what affects a decision to act—whereas volition is primarily concerned with the post-decisional state—that is, with what affects follow through on a decision once it is made. Motivation involves familiar notions such as internal and external goal orientation, self-esteem, self-efficacy, and various attributional interpretations. Volition, which is a less familiar term, describes notions such as persistence, will to learn, self-regulation, self-evaluation, and motivational control. It is in many ways similar to what Goleman describes as “emotional intelligence,” at least in respect of the *intrapersonal* dimensions of that concept. (For a discussion of the sub-components of motivation and volition see Ruohotie 1994 and 1996.)

Table 1 summarizes the determinants of lifelong learning that have been discussed in this short review of what it is that must be learned by a knowledge worker in order to keep pace with the turbulent world of rapidly emergent technologies, and thus sustain competence and productivity. The table is not intended to represent a psychological theory. It is purely intended to be illustrative. Nonetheless, it does provide a useful vernacular demonstration of the wide range of knowledge, skills, dispositions and characteristics which affect lifelong learning. The main purpose of the table is to emphasize that in order to function effectively as a knowledge worker in a dynamic environment an individual requires not only the right intellectual tools and dispositions but also the right personality characteristics, and that the full range of these attributes is influential in determining one's success as a lifelong learner (in addition, of course, to the organizational context).

The wide range of this table and the inclusion of personal characteristics such as honesty and courage may be daunting, but it is hardly unique. The Corporate Council on Education of the Conference Board of Canada, for example, has developed an “Employability Skills Profile” of attributes which its business members want to see in their employees. In addition to the ability to think, communicate, learn and work with others, it includes positive attitudes and behaviors, responsibility and adaptability. Under these latter categories it calls, among

other things, for ,” “initiative, energy and persistence to get the job done,” “self-esteem and confidence,” “recognition of and respect for people’s diversity and individual differences,” and “honesty, integrity and personal ethics.”

Table 1
Some Determinants of Lifelong Learning

| | | |
|--------------|-----------|----------------------|
| Intelligence | Cognition | Knowledge |
| | | Understanding |
| | | Thinking Skills |
| | | Insight |
| | | Intrapersonal Skills |
| | Conation | Interpersonal Skills |
| | | Persistence |
| | | Will to Learn |
| | | Self-Regulation |
| | | Self-Evaluation |
| Personality | Conation | Motivational Control |
| | | Goal Orientation |
| | | Self-Esteem |
| | Affection | Self-Efficacy |
| | | Curiosity |
| | | Honesty |
| | | Optimism |
| Courage | | |

In a dynamic environment that calls for continuous learning and re-learning by both individuals and groups, the “soft” skills of teamwork and the “deep” attributes of personal and intellectual integrity are at least as important as the traditionally valued “hard” competencies of academic knowledge and procedural ability. Although this is now widely understood, common practice in educational programs and workplaces has not changed to reflect the understanding. Thus, if students do not have the “soft” skills and “deep” attributes required for lifelong learning, they are unlikely to develop them as a result of their educational program and may even have them suppressed in the pursuit of narrowly defined academic success. If they are to be learned, then, how might that occur in an educational program or on the job?

How Is It Learned?

As mentioned at the outset, the focus of this chapter is on lifelong learning which occurs after formal schooling and initial credentialing is complete. Notwithstanding this intentional focus, it is important to acknowledge in passing that family life, pre-school, grade school and post-secondary experiences are fundamentally important. If they elicit, instruct, reinforce and consolidate skills, dispositions and beliefs that enable lifelong learning then subsequent competence and inclination is liable to be strong. If not, as is unfortunately often the case, the challenge of lifelong learning is all the more daunting. In an ideal world it would be wise to focus efforts at improving lifelong learning abilities on teaching positive parenting, providing quality daycare and pre-school experiences for all, and making schools, colleges and universities into true learning organizations. I certainly hope that will occur, but while we are waiting for it to occur, and even if it were to occur, it is important to consider how the “soft” skills and “deep” attributes that enable lifelong learning can be elicited and strengthened in the workplace. In the context of this chapter that would mean a public school, but the fundamental characteristics of the workplace which will invite and sustain learning are common across tasks and settings.

Before considering how the determinants of lifelong learning can be influenced through adult experience, let us acknowledge that some of them are easier to change than others. Human beings can change their perspectives, assumptions and behaviors at any age, but the more fundamental the change the greater the support required to make the change and the longer it takes. Thus, while concepts and skills can be learned quite quickly, insight, self-regulation, self-efficacy and courage are learned more slowly. However, it is exactly this sort of deep transformation that is required. Surface learning will not do the job for knowledge workers of any sort, including teachers.

On the basis of more than two decades of his research at the Harvard Graduate School of Education and the Massachusetts School of Professional Psychology, Robert Kegan also contends that the lifelong learning which we require goes well beyond new understandings and skills. In his view, “the demands of work, the hidden curriculum of work, does not require that a new set of skills be ‘put in’ but that a new *threshold of consciousness* be reached.” (Kegan 1994, 164) Kegan proposes a psychological theory in which the self evolves well beyond the teenage years, at which age some final state of “adulthood” has traditionally been presumed to have been reached, and that new orders of consciousness remain to be achieved “out of a lifelong process of development: a succession of qualitative differentiations of the self from the world ... successive triumphs of ‘relationship to’ rather than ‘embeddedness in.’” (Kegan 1982, 77) Kegan’s third order of consciousness, which he considers essential to effective living in the “modern” age, is characterized by the ability to hold two contradictory values or goals in mind simultaneously without being frustrated or paralyzed by their inconsistencies. His fourth order of consciousness, which he considers essential to effective living in the “postmodern” age, is characterized by the ability, indeed the understood necessity, to be self-evaluating and self-correcting, to rise above allegiance to any particular value or purpose and focus on the ongoing “process of originating or inventing what is valuable, a determination that heretofore has been made by the psychosocial

surround.” (Kegan 1994, 169) According to Kegan, most people never achieve this fourth level of critical consciousness and are consequently “in over their heads” in the postmodern world.

Since deep transformations take so much time and effort, organizations are well advised to hire carefully in the first place and ensure that their new employees already possess as many of the fundamental attributes that they desire as possible. Having hired wisely, it is then important to be equally judicious in choosing whom to promote to positions of influence within the organization. As noted earlier, in the dynamic world of knowledge work if you are not a part of the solution then you are a part of the problem, and organizations cannot afford to have supervisory personnel who are part of the problem. In fact, in an organization engaged in knowledge work, responsibility for organizational learning is directly proportional to authority. Whereas in the Industrial Era the purpose of supervisory personnel was to ensure that employees faithfully fulfilled their job descriptions and thus sustained the mechanical bureaucracy, in the Information Age the term “supervisor” must take on a radically different meaning; as radically different as the Information Age is from the Industrial Era. Knowledge work supervisors must be teachers not inspectors. Their job is to promote invention, not prevent error. They must facilitate rather than direct, inspire commitment rather than merely ensure compliance.

However, no matter how careful and sophisticated an organization’s hiring and promotional practices may be, there remains the imperative for the organization, and the individuals within it, to be continuously re-created; that is, to learn. All employees, not matter how well educated and broadly experienced, will have things to learn, and as the organization continues to re-create itself all employees must progress just to stand still in the surging currents of change. In the case of a school, which may appear on the surface to be extremely stable in its work, the need for continuous learning results as much from the divergent complexity and open-endedness of the teaching task as from the changing nature of the students and the school’s mandate. Thus, a robust program of on-the-job training is essential for an organization, such as a school, engaged in knowledge work. But what form should this training program take, and is mere training sufficient?

It is important at this point to distinguish between “training” and “education.” The Funk and Wagnall’s Standard College Dictionary defines training as “practical instruction or drill, as to acquire a skill” and a skill as “proficiency or technical ability in any art, science, handicraft etc.” Education is defined as “systematic training of the mind, capabilities or character through instruction or study.” Thus, while the distinction is not entirely clear (as shown by the use of “training” in the definition of education), training implies drill-oriented instruction which enhances or extends ability in relatively well-defined practical tasks whereas education implies deeper reconsideration of existing concepts and assumptions as part of an expansion of awareness into new realms—not only of knowledge and skill but also of thought. Indeed the Latin root of the word education means “to lead out” and suggests this excursion into new domains of thought. There is also a stronger component of metacognitive awareness and critical orientation to education than to training.

Education is, however, not a uniformly defined concept. One of the most fundamental schisms is between those who view education as the acquisition of pre-existing knowledge and those who see it as the construction of personal understandings, what we may term the

behaviorists and the constructivists or the traditionalists and the progressives. While the former concept is now known to be inadequate and to misrepresent the learning process (e.g., Gardner 1991), it unfortunately continues to dominate most educational programs and institutions (e.g., Goodlad 1984).

Paulo Freire describes the former view, which he terms the “banking concept” of education, as follows: “a narrating subject (the teacher) and patient, listening objects (the students).” Freire finds that the contents of education in this form “tend in the process of being narrated to become lifeless and petrified.” (Freire 1968, 57) Nonetheless, research shows that lecture methods continue to predominate in public schools and universities (Goodlad 1984) and it is also the rare inservice program which does otherwise. This approach to education, teaching as telling and listening as learning, is very much like training.

A more modern conception of education is progressivism, most often associated with John Dewey. In this genre it is the student’s mental activity, rather than the teacher’s, which is the primary focus. Group discussions, hands-on activities, and practical applications are typical of this approach, which is supportive of a constructivist understanding of learning. Knowledge, or more accurately understanding, is one intended outcome but development of skills and attitudes is equally important. Learning activities that involve relevant, open-ended topics and interactive techniques create the potential for meaningful experience rather than simply transmitting predetermined information to students.

The progressive approach to education, learning as doing and teaching as facilitating, is rather like an intellectual apprenticeship. It involves not only the transmission of information but also transaction between the teacher and the student, and between the students themselves, which allows them to develop personal understandings and ultimately to transform themselves through the development of new skills and attitudes which transfer to other contexts.

Education, defined in the progressive mode, has the potential not only to impart generative knowledge and thinking skills (i.e., cognition), but also to develop conative attributes such as persistence, self-regulation, motivational control, goal orientation and self-efficacy. Given time, it can even influence affective attributes such as curiosity and courage. It is this sort of deep transformation within employees that is the prime determinant of an organization’s ability to sustain its vitality over the long-term. Thus, instead of speaking about “on-the-job training” it would be more appropriate for knowledge work organizations to discuss “on-the-job education” and to ensure that the change in terminology is accompanied by a commitment to progressive techniques.

Much has been written about the progressive approach to education, but there is no simple set of prescriptive procedures for this kind of instruction. Indeed, a basic tenet of progressive education is the shift from a focus on what is to be taught, and thus on who is teaching and how they are teaching, to what is to be learned, and thus on who is learning and how they are learning. Because students are so diverse in their characteristics and abilities, this implies that effective instruction cannot be consistently prescribed, but must be developed in each situation based on fundamental principles of learning and the nature of the particular learners. The Ministry of Education in British Columbia, Canada, has summarized

the basic principles of learning which underlie the progressive approach to curriculum and instruction as follows.

- Learning requires the active mental engagement of the student.
- People learn in different ways and at different rates.
- Some learning is individual and some is social.

These simple statements have profound implications for the design of educational programs in any setting—school, university, or workplace. Active mental engagement can only be achieved through relevant, accessible learning activities which invite the voluntary inner commitment of the student. The diversity of student learning needs and styles in any group suggests that these learning activities need to be open-ended and supportive of a variety of modes of participation. Educational programs should adapt to the participants and not vice versa. Some of the learning activities will be individual but a significant number will be group activities, particularly when it is collective competence which is the key to organizational effectiveness, and this implies that learners of all ages must be taught how to learn and work in collaborative groups. Collectively, these three principles suggest an educational approach radically different from long-standing traditions of teacher-centered instruction and the lecture-style inservice training that predominates in organizations.

Goleman (1998) terms the common misconception that one can cause the sort of deep change required to affect conation, or emotional intelligence, in the same way that one can effectively teach how to create a business plan, the “billion dollar error” of North American industry. Deep change requires significant neurological rewiring as we change our habits of thought, feeling and behavior. That means that on-the-job educational programs which aspire to such change must be highly relevant and deeply engaging at the personal level and must provide for supported practice over a long period of time as new intellectual and emotional structures are inculcated. The time frame for this sort of change is years and if we aspire to lifelong change, to learning as a way of being, it is a continuous experience of being in the midst of reconstructing our understandings, with all of the tentativeness and insecurity which that entails. Well-structured formal programs with clear goals and limited time frames can be very useful, but a supportive and motivating environment is required to enable the continuous cycle of experience, reflection and reconstruction which can truly be called lifelong learning.

A supportive environment for learning includes all aspects of workplace experience. If an employee begins to learn something through an on-the-job educational or training program but has no opportunity to consolidate that understanding and practice its application then it might as well not have been learned. In fact, this experience may frustrate the employee and thus have a negative net effect. Ruohotie (1999) discusses the challenge of “relationship-based learning in the work environment,” which is an important related topic beyond the scope of this article. It is essential to appreciate, however, that on-the-job learning comes not only from planned programs of instruction but also from day-to-day experience. Employees are learning all the time, whether that is planned or not, and if the work environment does not elicit and reinforce the understandings and behaviors that an organization requires then planned programs will have little effect.

Not only does the work environment affect individual learning, it also affects the way that groups of individuals interact. Stacey (1996, 41) comments on the effect of the work environment on collective thought and action as follows.

Organizations are wholes taking the form of networked systems that consist of either individual or group agents, and usually both. Agents in organizations interact with each other to produce patterns of thought and action at an organizational level. Regularities in those patterns come to be embodied in a shared schema—a culture, ideology, or bureaucracy at the organizational level—that then drives further behavior and thought. The shared schema can be thought of as the dominant one because it drives the performance of the current primary task, but a recessive schema, consisting of all the unshared perceptions, thoughts, and behaviors of the members of an organization, could become available to an organization later on.

It is important to note three implications of this view of organizational dynamics. First, organizations must be structured and behave in ways which are consistent with and supportive of what they profess to believe and ask of their employees if they want individuals to assimilate those values and behaviors. If they do, then there is a reciprocal effect on employees, who reinforce the organizational culture in a positive feedback loop as they begin to embody it. Second, there are hidden messages and meanings in patterns of organizational behavior which may not be obvious, but this “recessive schema” may become visible and influential in the future. This could be very good, or it could be counter-productive. Thus, it is important to pay careful attention to even the apparently minor details of organizational behavior to ensure that it supports, and reflects, what is valued and intended. Third, the culture of an organization is a primary determinant of individual and collective learning. Its power is subtle but pervasive and it can overwhelm intended change introduced through structural adaptations alone.

Assuming personnel who are inclined by nature to question and learn, sophisticated educational programs for these employees, a supportive organizational climate and a learning-friendly culture, how might we expect individual and organizational learning to proceed? It is important to realize that it is liable to emerge along a broken and unpredictable front, and that progress will be more easily identified in hindsight than in process. This is partly because as organizations and the individuals within them co-evolve much of what they each learn is at first implicit rather than explicit. It is understood but not yet articulated.

Nonaka and Takeuchi (1995) describe this implicit knowledge as “tacit” in keeping with Polanyi’s original articulation of the concept. They describe two dimensions of tacit knowledge, technical and cognitive. The technical dimension encompasses all the informal and hard-to-describe skills and procedures, often described informally as “know-how,” which develop in a work group and which enhance its efficiency and effectiveness through common understandings, procedural conventions and unspoken behavioral norms. The cognitive dimension consists of schemata, mental models, beliefs and perceptions so ingrained that we take them for granted, but which have a critical impact on our image of reality (what is) and our vision for the future (what ought to be). It includes the conative and affective determinants of lifelong learning as summarized in Table 1.

Nonaka and Takeuchi feel that the subtle but important influence of tacit knowledge is better understood by Japanese companies than Western ones and that this has important implications for their organizations.

Although Western managers have been more accustomed to dealing with explicit knowledge, the recognition of tacit knowledge and its importance has a number of crucially relevant implications. First, it gives rise to a whole different view of the organization—not as a machine for processing information but as a living organism. Within this context, sharing an understanding of what the company stands for, where it is going, what kind of a world it wants to live in, and how to make that world a reality becomes much more crucial than processing objective information. Highly subjective insights, intuitions, and hunches are an integral part of knowledge. Knowledge also embraces ideals, values, and emotion as well as images and symbols. These soft and qualitative elements are crucial to an understanding of the Japanese view of knowledge. (Nonaka & Takeuchi 1995,9)

The point of these observations is to emphasize the fact that on-the-job learning comes from the totality of an individual's experience on the job, not just from intentional instruction. Thus, one must conclude that formal programs are necessary but not sufficient, and that the working environment has an equally important role to play in employee and organizational learning. It is not just that the environment must reinforce what is learned in formal programs. It is also important to realize that the environment is the very source of much learning, particularly the tacit variety, which is often more important. Our experience is shaped by our environment and that experience is the raw material for subconscious processes of reflection and learning which lead to intuitions which become insights which become understandings, and which, over time, become our values and our assumptions. This is as true for adults in the workplace as it is for children in their homes, for while adults may have already established value systems and cognitive schema, these are both malleable and evolve through experience, albeit somewhat more slowly in adulthood than in childhood.

This being the case, one might think of organizational support for learning by analogy with gardening. The first and most important task in gardening is to prepare the soil and to ensure that plants are placed where they will receive appropriate quantities of sun and water according to their characteristics. After that, while one may still need to pull some weeds from time to time, the work of a gardener is basically supporting rather than managing the natural processes of growth, and the eventual outcome is determined more by the selection and preparation of the environment than by direct interventions afterwards.

Still, intentionally selected and planned programs do have an important role to play. One approach which has shown particular promise is problem-based learning. Bridges and Hallinger (1998,13) report that over 80% of the medical schools in the United States have begun to use problem-based learning, which they define in terms of five characteristics.

- The starting point for learning is a genuine problem.
- The problem is one that students are apt to face as future physicians, or administrators.
- Subject matter is organized around problems rather than discrete disciplines.
- Students assume a major responsibility for their own learning.

- Most learning occurs in the context of small working groups rather than lectures.

Engagement with genuine, rather than abstracted or idealized, issues is central to this approach. Instead of learning a theory and deducing how it is to be applied to a new situation, participants engage with rich experience in order to build understanding inductively. That is not to say that there is no place for direct instruction in theory followed by guided application of that theory in practice, but only that such an approach is less engaging and generative than problem-based learning.

This process of learning is best understood as knowledge creation in the constructivist sense, rather than information acquisition. Bird (1994) describes it as being grounded in an individual's tacit knowledge base, which originates subconsciously through the interplay of thought and action and is then drawn out, made explicit and labeled with language through a dialogue in which a group negotiates common understandings. "This is usually a dynamic process in which members try out various interpretations and meanings. Through debate and discussion, unity and coherence in meaning and understanding converge in an explicit form which all members ... can understand and assimilate." (Bird 1994, 332) Of course, introspection may be undertaken alone, but it will be neither as rich nor as shareable as that which occurs in common with others.

Leithwood and Steinbach (1994) describe research on a program of problem-based learning for school principals and conclude that problem-based learning is a more promising approach than on-the-job experience alone, which is a "relatively slow and unreliable" approach in comparison. In this case the program was conducted outside of the day-to-day experience of the principals, but teaching potentially provides a continuous string of "case studies" which could themselves be the source of learning for the teacher if s/he were to bring that attitude and intention to the work and if the necessary time and support were available. No matter how effective an inservice program may be, it can, at best, provide short-term stimulus and support. Since the time frame for "re-creating" and "re-perceiving" is long, learning must be a continuous lifelong process if we are to avoid the calcification which so easily sets in, and if it is to lead us to the new levels of consciousness which Kegan suggests we require. Thus, the school environment must be conducive to lifelong inquiry and learning for teachers. The conditions and strategies which are required deserve just as much, and probably more, careful consideration and resource support as do the preservice and inservice programs which have traditionally been the focus of attention.

Conclusion

Learning is a continuous process of re-creation that has not only cognitive but also conative and affective dimensions. Individuals must develop their personality, or 'self,' as well as their intellect. To thrive, and perhaps even to survive, in the dynamic environment of the Information Age, not only individuals but also organizations must undertake to continuously re-create themselves through a collective learning process on the job and through the job. On-the-job learning is facilitated by well-designed educational programs in the progressive style, but must also be supported by workplace experiences which enable and encourage creativity and innovation, and by a workplace culture that values and supports

learning. Thus, knowledge work organizations must develop a learning strategy that includes the creation of nurturing learning environments as well as sophisticated programs of instruction. These observations apply to all organizations engaged in knowledge work, none more so than schools, colleges and universities, where they are, unfortunately, not the norm.

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