

Informal and Incidental Learning in the Workplace

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Periodically, scholars have grappled with the idea of informal and incidental learning, concepts that are typically defined in contrast with formal, structured education and that center around learning from and through experience. Over the past 16 years, Marsick and Watkins (1990, 1999) have evolved a theory of informal and incidental learning that has been used in a number of dissertations and published studies. Growing out of thinking about learning from experience and self-directed learning, their model focused on the learning phases of an individual and added stages of reflective learning that usually occur incidentally but that, with coaching, can deepen this learning.

Over that same period of time, informal learning has moved from an interesting phenomenon at the edges of human resource development and training to mainstream practice (Cross, 2007). Companies in the United States such as IBM have blended formal and informal learning in its On Demand Learning system (IBM Learning Solutions, 2005). Dale and Bell (1999), in a research review, identified many benefits of informal learning at work, for example: flexibility, employability, adaptability of learning to context, rapid transfer to practice, and resolution of work-related problems through regular review of work practices and performance. Dale and Bell also identified drawbacks, namely, a narrow, contextual focus; learning bad habits or wrong lessons; accreditation challenges; and the fact that such learning is so well integrated with work that it may not be recognized. In Europe, as Malcolm, Hodgkinson, and Colley (2003) note, "Current EU policies in lifelong learning are raising the profile of informal and non-formal learning. The recognition and enhancement of such learning is seen as vital in improving social inclusion, and increasing economic productivity" (p. 313). Elsewhere in Europe, in support of this observation, the Government of Norway launched the Realkompetanse Project to "give adults the right to document their non-formal and informal learning without having to undergo traditional forms of testing." VOX, the Norwegian Institute of Adult Education (2002), led by Turid Kjolseth, describes realkompetanse as "all formal, non-formal and informal learning acquired by adults" (p. 5).

Recently, Marsick and Watkins have focused on the context (comprised of both the external and internal organizational environments) as a significant component of their model. What is it about this context that so significantly influences informal and incidental learning? As we discuss in this chapter, whole person models of learning (Heron, 1992; Heron & Reason, 1997, 2001; Yorks & Kasl, 2006), theories of artistic learning (Lawrence, 2005), and theories of situated learning (Wenger, 1998) offer partial explanations. Our own evolving work (Cseh, Watkins, & Marsick, 1999; Marsick & Volpe, 1999; Callahan, 1999, Watkins & Cervero, 2000) offers additional perspectives.

Newer research and theory development about workplace learning—including informal and incidental learning—is also moving from a focus on the individual to a deeper understanding of collaborative learning (Raelin, 2000). Learning and action at work is

essentially social learning (Brown & Duguid, 2000). Learning is constrained by the rules that govern action in an organization, by the resources available to a learner, and by the receptivity of others within the organization that affect whether or not the learner may try or apply what he or she has learned. Learning is usually undertaken by individuals for group or organizational purposes, may be guided by supervisors, and may be a shared quest with co-workers; it is affected by the mirror of co-workers' responses. Whether undertaken collaboratively or not, the collective nature of the workplace nudges, imprints, or controls what is learned.

This chapter focuses on learning *in the workplace*, although workplace settings are broadly defined to include businesses, not-for-profits, the public sector, educational institutions, and religious venues. We focus on the workplace in part for practical reasons. The range of purposes and settings for informal and incidental learning research is so varied that review and comparison is difficult without some common focus, particularly since many studies of informal and incidental learning are qualitative in nature and use varied theoretical frameworks to guide interpretation of findings. Moreover, we focus on the workplace because a good deal of adult learning takes place at or for work. Even though critics decry the extent to which economic forces have colonized the life-world, to borrow a term from Jurgen Habermas (1987), adults in the "developed world" spend many hours of their lives at work. And while adults rely on education and training to prepare them for work and, increasingly, to update their knowledge and skills, there is simultaneously an emphasis within organizations on learning on the job that is driven by, and integrated with, work routines.

In this chapter, we discuss the historical antecedents of informal and incidental learning, including early work by Marsick and Watkins (1990). We review key themes and trends in recent research to set the stage for rethinking this model of learning. We then recount our own experience in using this model in our own collaborative work together, and how our own use of the model helped us to understand four critical limitations with the way we had constructed our model. We turn to alternative bodies of theory and research that help rethink our theory. We conclude with a critical appraisal of outstanding issues that grow out of our review of research.

Definitions and Model for Understanding Informal and Incidental Learning

Putting definitional and operational boundaries around informal and incidental learning is a challenge. Marsick & Watkins (1990) defined informal and incidental learning as "learning outside of formally structured, institutionally sponsored, classroom-based activities" (pp. 6-7) and asserted that such learning "often takes place under non-routine circumstances, that is, when the procedures and responses that people normally use fail" leading to greater attention to, and awareness, of "tacit, hidden, taken-for-granted assumptions" that may help learners rethink situations in which they find themselves and re-frame their understanding of the kind of learning they might need to undertake. They further distinguished incidental from informal learning by defining it "as a byproduct of some other activity, such as task accomplishment, interpersonal interactions, sensing the organizational culture, or trial-and-error experimentation" (pp. 6-7). They contrasted the sometimes intentional and more possibly planned nature of informal learning with the accidental and often semi-conscious nature of incidental learning.

Informal and incidental learning outcomes depend, in part, on the degree of conscious awareness with which one attends to learning and the environment that brings

learning opportunities. Formal learning opportunities heighten awareness, but such learning is divorced from real life action. Informal learning benefits from being linked to meaningful job activities, but it requires greater attention to making the most of the learning opportunity, something that might involve planning and almost certainly involves some conscious attention, reflection, and direction. Incidental learning, while occurring by chance, can be highly beneficial when one moves the accidental learning opportunity closer into the informal learning realm through conscious attention, reflection, and direction.

Marsick and Watkins' (1990) framing of informal and incidental learning is based on theory of learning from and through experience—distinguished from the more designed experiential learning activity described by Kolb (1984). Learning from experience and experiential learning theories rest on Dewey's (1938) pragmatic cycle of problem solving through reflective thought. Reflective thought begins with a disjuncture between what is expected and what occurs, which can lead to re-thinking the nature of the problem and the directions in which one might look for solutions. Solving a problem involves one or more cycles of trial and error in which learning takes place as one seeks to achieve a desired outcome. Observation of what occurs leads to course corrections and eventually to conclusions and planning for how one will address similar situations going forward. Dewey essentially adapted the scientific method to solving problems of everyday life. This same cycle is at the heart of action research, developed by Kurt Lewin (1947) and others based on systematic cycles of problem definition, data gathering, reflection on evidence, learning, and planning based on what was learned. Lewin added an emphasis on collective problem solving of socially shared concerns. Lewin thus moved the more individually oriented learning cycle in interaction with one's environment, as advocated by Dewey, to a group and organizational learning level.

Of the various theorists who built off Lewin's work, Chris Argyris and Donald Schön (1974, 1978) developed action science, a systematic theory for learning from experience in groups and organizations. They developed the idea of a theory of action, comprised of espoused theories, which represent an individual or organizational ideal, and theories-in-use, which represent how such theories are carried out. Argyris and Schön sought ways to close the gap between the ideal and the actual. They adopted Dewey's idea of a disjuncture between what was expected and what occurred (an error) as a trigger for learning how to correct a course of action or tactics (single loop learning) to achieve one's goals. When changes in tactics do not achieve desired ends, they suggest switching to double loop learning in which one examines values, assumptions, and beliefs that influence how a situation or problem is framed. Reframing the situation or problem often leads to more effective desired solutions, which typically one then has to learn how to implement.

Marsick and Watkins (1990) adopted Argyris and Schön's basic framework for their theory of informal and incidental learning. Depending on the degree of awareness, intention, and direction, one might be engaging in either informal or incidental learning. But in both kinds of learning, one's attention might be focused on either single or double loop learning. Marsick and Watkins further adopted Simon's (1965) distinction between routine and non-routine work. They noted the shift, fueled by globalization and high technology, towards rapidly changing environments and a knowledge era that lent itself more often to what the Army Defense College was calling VUCA environments that were volatile, uncertain, complex, and ambiguous. They suggested that increasingly, employees throughout most organizations were likely to find themselves addressing non-routine problems and challenges that call for customized responses that require greater levels of judgment and learning.

They drew on Polanyi's (1967) discussion of tacit knowledge, from which Schön (1983) also drew in developing his theory of reflective practice. Now more widely known through the work of Nonaka and Takeuchi (1995) on knowledge creation, Polanyi pointed out that discoveries in chemistry and other scientific disciplines were not at all rational, value-free, and objective. Instead, Inkster (1987) depicts the thrust of Polanyi's work as shedding light on the "ubiquitous personal coefficient in all knowledge" (p. 114). Polanyi described scientific work as "full of every variety of subjective emotion, including curiosity, exhilaration, frustration, anxiety, and an intense persuasive passion or need to convince others of the correctness of the interpretation of the phenomena he observed." In making interpretations of complex situations, Polanyi noted how our past experience and understanding influences interpretations of present circumstances and how much of that framing of the situation remains outside of our critical awareness and purview.

Roots in Other Definitions

Others have also written about informal and incidental learning. Malcolm Knowles (Overstreet, in Knowles, 1950) differentiated between formal adult education, carried out through systematic instruction—"given in the regular way of teacher, textbook, recitations, examination, and credit"—and informal learning at "times—and these more frequent—when what he most needs is not and could not be found in any formal course of instruction" (p. v). Marsick and Watkins' (1990) contribution was to create a framework and model that could be further researched and tested and that focused more explicitly on the workplace as a context and shaper of such learning. Knowles (1950) dealt more with educational method and did not take into consideration to the same degree the "social contract among individuals who work together to achieve higher-order organizational goals ... (requiring that) individuals learn and work in social units where interactions are not typically subject to design and control by trainers" (p. 35).

Malcolm, Hodkinson, and Colley (2003), in summarizing research commissioned by the Learning and Skills Development Agency of England, used a four-fold heuristic device to discuss differences among formal, informal, and nonformal learning: learning processes, location and setting, purposes, and the nature of what is being learned. They also note that defining informal learning is both problematic and political. Straka (2004), in tracing the genealogy of informal learning, describes it as "a metaphor with a severe problem, namely the lack of systematically and empirically grounded valid evidence on why, where, when, how and what is learned under 'informal conditions'" (p. 2). In an extended discussion of definitions, Gorard, Fevre, and Rees (1999) draw on Eraut, Alderton, Cole, and Senke (1998), whose definition of non-formal learning emphasized a lack of constraints by "prescribed frameworks," to characterize informal learning broadly "such that it includes learning taking place as a process outside formal participation." They thus exclude informal learning that might occur during structured training and education, though our definition of incidental learning includes learning in these circumstances. They go on to describe informal learning, as do we, as characterized by some intentionality despite the lack of formal structure, that is, "non-taught learning ... (that) includes non-certified episodes, and those leading to tacit knowledge ... both at work and at leisure" (pp. 437-438).

Conceptualization of learning as socialization, derived from Vygotsky's cultural-historical psychology, offers a view of informal and incidental learning that differs from Dewey's pragmatic philosophy in which the individual learner acts on his/her world. Vygotsky instead suggested that learning is a natural maturation process shaped by history and

culture. External social interaction, over time, becomes internalized and is culturally mediated through the use of language, tools, and artifacts. Learning and development occur through social interaction and culture change (Wertsch & Tulviste, 1996). Learning begins with internalization via socialization, but it can move into a period of innovation through externalization when disruptions call for intentional questioning, critical reflection, and problem solving (Engestrom, 1999). Situated learning (Lave & Wenger, 1991), with antecedents in Vygotsky's work, describes learning that occurs informally and unintentionally through social interaction within a natural workplace context.

Incidental learning might be best understood through socialization theory. Incidental learning has retained a focus on its accidental, unplanned nature over several decades. Postman and Senders (1946) drew on McGeoch (1942) in defining incidental learning as unintentional, accidental, and unstructured. Stokes and Pankowski (1988) emphasized the way learning "occurs by chance while one is engaged in another activity" (p. 89). Jarvis (1987) described incidental learning, using his typology of reflection, as non-reflective and reactive, but he concluded that such learning "should not be minimized since this is a major part of the process whereby people learn and acquire their culture and by which it is maintained through taken-for-granted behavior" (p. 32).

The 1960s saw scholars examining the incidental learning of the "hidden curriculum" in classrooms. These discussions continue. For example, Bloomberg (2006), in studying video-based distance learning communities in Jewish higher education programs, found that: "Much of the 'changed thinking,' or cognitive development as a consequence of participation in this learning community might in fact be attributed to this program's 'hidden' or implicit curriculum ... which offers unintended and often unexpected outcomes or benefits" (p. 248). Reischman (1986) distinguished learning "en passant" from intentional adult learning with a focus on the unintentional learning that might arise from otherwise planned tasks or events. He characterized learning "en passant" as: "integrated, holistic, not compulsory, individualized, uses a wide variety of support, builds on previous learning, can be a basis for further learning, and ... can be especially identified by looking back, i.e., by reflection" (Marsick & Watkins, 1990, p. 34).

Studies and discussions of informal and incidental learning frequently intermingle these two terms, and some authors (for example, Candy & Crebert, 1991) use the terms "informal," "incidental," and "non-formal" in ways other than do Marsick and Watkins (1990). Ellinger (1997) is among those few who pointed out the difference between informal and incidental learning. As did Marsick and Watkins, she hinged the distinction on the issue of learner intent and the planned activity that grows from that intent, while informal learning more clearly grows out of defined learner intentions than incidental learning. However, in a major study of informal learning at work, Bruce, Aring, and Brand (1998) seemed to ignore the concept of incidental learning, but included within informal learning the

acquisition and application of skills and knowledge; movement along the continuum from inexperience to confidence; and maturity and expertise in regard to specific tasks, skills, and knowledge...[in a learning process that] is neither determined nor designed by the organization. (p. 15)

As we also have done, the authors highlighted the critical role of contextual factors in informal workplace learning, and they listed intrapersonal and interpersonal skills as well as cultural assimilation among the participants' learnings. Another example of how types of learning intermingle is a study of training by Verespej (1998) who also speaks to

much incidental learning, including (1) aspects of intrapsychic and interpersonal skills, (2) cultural information, shared values, and goals, (3) ability to devise and communicate ideas, and (4) how to reflect on different approaches to problems. Moreover, the learning situations described align with many settings that nurture incidental learning, such as team participation, meetings, mentoring, peer-to-peer interchanges, and customer interaction. Ultimately, Verespej's conclusion that "if learning is to take place, there must be a culture of openness and trust that is more than empty words" (p. 42) applies to many work settings and underscores the institutional context as an influence on informal and incidental learning in the workplace.

Delimiters and Enhancers

Marsick and Watkins (1990) also identified conditions that might delimit or enhance such learning. Delimiters include framing and capacity. Enhancers include creativity, proactivity, and critical reflectivity.

Argyris and Schön's theory and the work of Polanyi led to the first key delimiter of informal and incidental learning: the way in which we frame our understanding of a situation and the degree to which we are open to re-framing that view. Incidental learning, in particular, is prone to this limitation because little attention is given to such learning in the midst of pursuit of a different task or purpose. The organization's culture and pressures, including time and resource constraints, can reinforce a reluctance to take time out to reframe. Yet problem framing is crucial for informal and incidental learning. Widening one's vision to include aspects of the context in which problems rest opens up multiple definitions of a situation and frees one to examine other learning-related concerns. Problem framing also influences the lens through which one defines a situation. Inkster (1987), for example, noted that Polyani reanalyzed many studies conducted by behaviorists and came to very different understandings of the situation: "Where the behaviorists had seen conditioning, Polyani saw intelligent learning, even in life forms as primitive as worms" (p. 117). The way people frame a situation can thus be a powerful shaper of perception and understanding. Informal and incidental learning benefits when tacit framing is made explicit and thus examinable in light of alternative perceptions.

A second delimiter of informal and incidental learning derived from the work of Elliot Jacques (1988) on work capacity. Jacques describes intellectual capability as the ability to engage in goal-directed behavior in problem solving and everyday work. His extensive research studies focus, in part, on how individuals vary in work capacity, measured in terms of the longest period of time that a person can conceive of a project (in operational terms) and act toward accomplishing the goals of that project without needing feedback. Although controversial, Jacques' work suggests that individuals vary widely in ability to conceive the scope of work and of a learning task.

Developmental theory can be used to support Jacques' claim that all adults may not be ready to conceive the scope of work and learning tasks on their own. Kegan (1982, 1994) argues that as adults mature, they are able to take what has held them subject—that is, what is essentially part of how they perceive their reality—as an object. As adults hold as object what had been subject, their consciousness expands and they are able to deal with increasing levels of complexity. To independently manage one's learning agenda, a person should be "self-authoring," that is, not dependent on others even though one might choose to consult or collaborate with others. Kegan (1994) argues that many adults today are not self-authoring. Instead, they look to follow rules set by others or to follow what

respected role models suggest they do. This puts them "in over their heads" when challenged to take on tasks that require independent, critical thinking.

Informal and incidental learning may be shaped by these fundamental mind sets. Jacques does not hold that expanding capacity to move beyond these mindsets is likely. But Kegan and others (e.g., Torbert, 1991) argue that under the right conditions, people can transform the way in which they understand the world, which in turn will influence the lenses they use to learn, and thereby might expand capacity to engage fruitfully in informal and incidental learning that goes beyond current mental models. Those who would facilitate people's capacity for informal and incidental learning at work would want to challenge and support learners to the point where they would "own" their learning goals and intentionally find ways to take advantage of informal learning opportunities that help them meet these goals.

Creativity, the first enhancer of informal and incidental learning, enables people to imagine alternatives and think beyond their current circumstances or points of view. Schön (1983) described a process in new product development in which people were able to imagine new ways of understanding a need or its satisfaction through "seeing as" or "the perception of similarity before one can say 'similar with respect to what'" (p. 182). The example he used was idea generation to improve a paintbrush, a process that was helped when someone compared a paintbrush to a pump, thus opening up a new way of thinking about the nature of product improvements. Creativity helps learners break out of preconceived understandings and mental models that limit their ability to re-frame a situation or problem. Creativity involves playing with ideas in ways that open new possibilities. As discussed later in this chapter, this enhancer was a precursor to current thinking about the role of aesthetics in learning.

Proactivity, the second enhancer of informal and incidental learning, suggests a readiness to take initiative, an alertness to the environment and to opportunities it might afford learning. Its opposite, reactivity, connotes passivity, disempowerment, and in some cases, a somewhat fatalistic stance toward events in which circumstances are allowed to dictate one's response. Proactivity is related, in part, to the concept of autonomy and to empowerment. Autonomy, which is at the heart of self-direction in learning or work, is characterized by independence within the constraints in which one finds oneself. Empowerment, which depends partly on oneself and partly on the social or organizational environment, involves the experience of power to take action.

For critical reflectivity, the final enhancer of informal and incidental learning, Marsick and Watkins (1990) drew on Mezirow's (1985) work on transformative learning, also based on the work of John Dewey (1938), as: "the bringing of one's assumptions, premises, criteria, and schemata into consciousness and vigorously critiquing them" (p. 25). Informal and incidental learning, as we defined it, involves awareness of and reflection on actions and their underlying values and assumptions when desired outcomes do not materialize. Critical reflectivity is the ability to delve deeply into reasons why such desired results do not materialize.

Since Marsick and Watkins first developed their ideas, much has been written from the point of view of adult developmental theory about whether or not the ability to be critically reflective is tied to one's state of consciousness. In other words, building upon Kegan's (1994) subject-object theory, one has to be able to get outside of one's current mental models in order to take them as an object of critique, but the ability to do that is dependent on one's mental capability to see oneself from a broader perspective, and in organizational life, to understand how one's role is part of a larger system. Developmental theorists such as Kegan (1994) and Torbert (1991) suggest that not everyone holds

these capabilities, although they would also point out that conditions can be created that enable people to stretch beyond their current mental models and move toward broader, more inclusive mental models that do support critical reflectivity. Everyone, from this viewpoint, is not equally able to think critically, and therefore, may not be as adept when engaging in informal and incidental learning.

Model of Informal and Incidental Learning

Marsick and Watkins (1990) developed a model of informal and incidental learning based on the above definitions and grounding (see Figure 20.1). In this model, people use reflection to become aware of the problematic aspects of the experience, to probe these features, and to learn new ways to understand and address the challenges they encounter. Problem solving steps are located at vertical and horizontal axes, and are labeled (clockwise) as Top, Right, Bottom, and Left. Learning steps are located in between problem solving steps, and are labeled (beginning clockwise just before Top) as Top Left, Top Right, Bottom Right, and Bottom Left.

Problem solving begins when people encounter a new experience (Top). They frame the new experience based on what they learned from past experience (Top Left). They assess similarities or differences and use interpretation to make sense of the new situation. Often, people make these judgments quickly, without much conscious reflection. Reflection slows down the diagnosis, but it also helps a person to become aware of the complexity of the situation and the assumptions used to judge the new challenge.

After diagnosing a new experience, people learn more about the context of the problem (Top Right). They find out what other people are thinking and doing. They try to

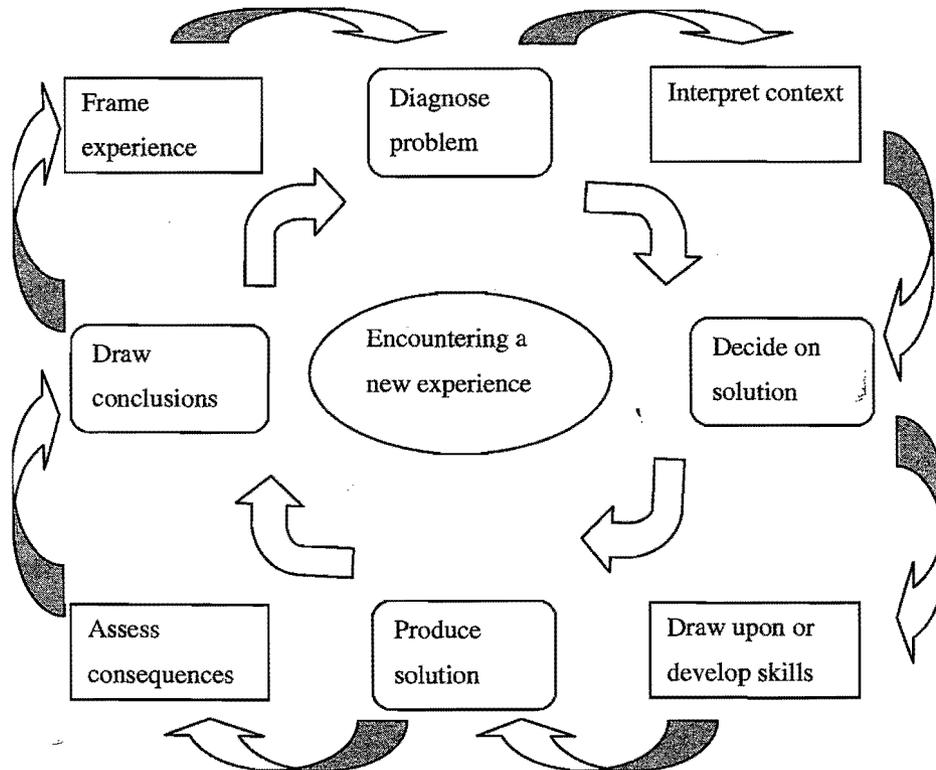


Figure 20.1 Marsick and Watkins' informal and incidental learning original model.

understand the political situation. They may gather information from other people or social groups that are affected by the problem. They might test their thinking with others or conduct mini-experiments before they choose a course of action. Reflection can play a key role in this phase by opening up lines of thinking that would otherwise have remained unexplored. Interpretation of the context leads to choices around alternative actions that are guided by recollections of past solutions and by one's own search for other potential models for action.

Once a decision has been made about a course of action (Right), a person develops or gathers resources to implement the decision (Bottom Right). Reflection might be anticipatory, and lead to the development of new capabilities in order to implement the solution. Often, reflection occurs while the action is being implemented over time. When people reflect-in-action (Schön, 1987), they typically do so when they are taken by some surprise in the course of action. Because they are learning as they implement, people may make quick judgments based on partial information. They may also seek further information during action.

Once an action is taken (Bottom), people assess consequences and decide whether or not outcomes match their goals (Bottom Left). Reflection after the fact allows for a full learning review. It is relatively easy to assess *intended* consequences when goals are reasonably explicit and data are available to make sound judgments. It is harder to recognize *unintended* consequences, although reflection can lead one to ask questions of a wide range of people and explore sources of information that might otherwise be ignored. A learning review leads to conclusions about results (Left) and lessons learned that can be of help in planning future actions. Reflection at this point brings a person full circle to the new understandings (Top Left) that are drawn in a new iteration of the cycle.

Reflection is central to every phase of learning from experience although everyone does not always consciously use reflection to its fullest potential. Reflection sensitizes people to surprises and mismatches that signal the inadequacy of their prior stock of knowledge. Through reflection-in-action (Schön, 1987), people adjust their course of action and learn while they are carrying out the solution. Reflection after the fact helps to draw out lessons learned that are useful for the next problem solving cycle.

Based on subsequent research using the model, Cseh, Watkins, and Marsick (1999) reconceptualized the model to emphasize the pervasive influence of context on all aspects of the model of informal and incidental learning. Cseh (1998) found 143 dissertations between 1980 and 1998 that discussed aspects of informal learning, including over twenty built on the informal and incidental learning model that Marsick and Watkins, separately and together, developed and modified over time. Several studies emphasized the role of context in informal and incidental learning research.

Cseh (1998) examined learning experiences that enabled owner-managers of small private companies in Romania to lead successfully in the transition to a free market economy. She was interested in what triggered their learning, what strategies they used, and what lessons they learned. In-depth, face-to-face interviews using a critical incident technique were conducted with 18 managers, between 28 and 62 years of age, representing both genders and the nationalities (Hungarian and Romanian) specific to the two regions selected. Cseh found that the foremost task faced by her participants was to make sense of the rapidly shifting environment and that, in this, interpretation of context dominated, as "context permeates every phase of the learning process—from how the learner will understand the situation, to what is learned, what solutions are available, and how the existing resources will be used" (Cseh, Watkins, & Marsick, 1999, p. 352).

Review of Research

We conducted a systematic review of research to update our knowledge of what others had found in their research on informal and incidental learning. In 1999, Mary Callahan reviewed research as part of her dissertation study. She selected 39 studies from *Dissertation Abstracts International* using the following criteria:

- Indexed as informal learning, incidental learning, or both
- Concerned with adults in organizational settings (workplace or otherwise)
- Included clear information regarding methodology, sample, and results

Several of these dissertations were read completely, others partially, and some were further discussed in other scholars' work on informal and incidental learning. In 2006, Marie Volpe searched JStor, and ProQuest for published research from 1999 to 2005 using the following key words: Informal and Incidental Learning. Additionally, she searched the Social Science Citation Index for studies that drew on the informal and incidental learning model described in this chapter. Volpe's attention was more directly focused on the workplace. Her search yielded 33 studies. Volpe conducted a search to update this database in early 2007, yielding an additional nine studies. Additionally, the authors drew from six dissertations on this topic that were not included in Callahan's (1999) review, plus articles and books retrieved through a Google search of informal learning, and selected studies relevant to new bodies of theory on which this chapter draws. A number of the articles that Volpe located were conceptual rather than empirical. Examples included Boud and Middleton's (2003) examination of how informal learning can only be partially explained by adopting a Communities of Practice framework (Wenger, 1998), contextuality in such learning (Hager, 2004), and a model of e-learning that incorporates informal learning (Svensson, Ellstrom, & Aberg, 2004).

Methodologically, qualitative studies dominate research on this topic, making it difficult to draw conclusions about the scope and dynamics of such learning across settings. Informal or incidental learning was frequently self-reported and only occasionally observed by the researcher. Qualitative, real-time descriptions by the learners' associates of changes in the learners were absent. A concern with self-reporting emerged during Rossing's study (1991), when he sought to conceptualize the phenomena of informal and incidental learning based on accounts of recalled experience. Interviewing members of rural community enhancement groups, he explored their beliefs about the contexts and actions contributing to effective group performance. His findings clustered into learning attributions, products, modes, strategies, and experience patterns. Rossing found that "participants were most likely to report... a 'learning' experience when strong expectations were contradicted somehow, and the individual subsequently revised his or her beliefs... [Also, participants]... were more likely to view beliefs based on positive outcomes as learning than beliefs based on reversal of negative outcomes." (p. 57). Rossing concluded that his study failed to advance understanding about the *quality* of what was learned, i.e., its accuracy and usefulness.

Taken as a whole, this body of research typically focuses on learning strategies. Perhaps because of the difficulty of grasping what is often a tacit and unstructured process, accounts of the dynamics underlying the use of learning strategies are explained using critical incidents or retrospective recall and retro-fitted into one or more theories of learning from experience. Overall, this research generally supports assertions that the large majority of learning is informal and incidental, yet there was also a recognition of

the synergy between formal and informal/incidental modes. Regarding the methods that adults used in learning informally and incidentally, the studies show that:

- Trial-and-error (also referred to as learning from mistakes or from experience) was by far the most often cited.
- Other frequently-cited methods included reading pertinent materials, observing the examples (models) of peers, supervisors, and "veterans," and finally, group involvement.
- The ability to critically reflect on one's own experience and mental models, either pre-existing or developed during the period of study, definitely enhanced learning.
- All types of learning occurred, but chiefly the learning of attitudes (like self-confidence and faith development), and both "hard" and "soft" skills.
- Acquisition of knowledge (information) was generally accomplished through self-directed learning projects.

Marsick and Volpe (1999), in an edited volume including six of the studies that Callahan reviewed, identified patterns of learning methods that echoed those in the Callahan review. They described informal learning as integrated with work and daily routines; triggered by an internal or external jolt; and an inductive process of reflection and action that is often linked to the learning of others.

Earlier research suggested that informal learning is increasingly pervasive and central to learning in organizations. Cross (2007) explicates sources that conclude that informal learning accounts for as much as 80% of workplace learning, even though about 80% of organizations' learning budgets are typically invested in formal training rather than informal learning. Bruce, Aring, and Brand (1998) suggested that as much as 70% of all workplace learning is informal, confirming prior findings on managerial learning at Honeywell (Zemke, 1985). Verespej (1998) concluded that "62% of what employees need to know to do their jobs is acquired through informal learning in the workplace" (p. 42). Mumford (1993) identified informal learning as the heart of managerial problem solving, echoing the findings of earlier studies by Burgoyne and Hodgson (1983) and Davies and Easterby-Smith (1984). Today, these percentages have even become standard rules of thumb for managerial development. GE developed a 70-20-10 leadership development practices rule that also shows up in other companies: that is, that such development should involve 70% on-the-job learning, 20% learning through relationships outside of one's area of focus, and 10% structured learning/training (Corporate Leadership Council, 2004).

Dominant in the research are ways that informal and incidental learning have been affected by external forces in the last few years that have impacted most work organizations, such as downsizing, outsourcing, mergers and acquisitions, cross-cultural and diversity challenges, virtual teaming, networking, and other effects of globalization and increased reliance on advancing computer telecommunications technology. Some studies of informal and incidental learning focus on concerns situated in particular companies or locations, such as the advent of terrorism in the United States and the responses to it at home and abroad (Stahl, 2005).

Downsizing and outsourcing have become predictable responses by organizations to maintain competitiveness and profitability. At the same time, these responses have created more fluid, dynamic, and unpredictable workplace environments. Svensson, Ellstrom, and Aberg (2004) describe organizational problems having to do with the integration of individual and organizational learning and specifically with the lack

of time for reflection and learning during conditions of change, restructuring, and downsizing.

The topics of the continuously changing workplace environment and implications for learning, for both organizational leaders and employees at all levels (Alcalde, 2005; Conlon, 2004; Enos, Kehrhahn, & Bell, 2003; Svensson et al., 2004), are well documented. In discussing the influence environment has on learning, Hager (2004) characterizes informal learning as "the daily actions of making contextual judgments" (p. 49). This focus on environment underscores the importance of context as employees try to make sense of contextual changes—what are the new expectations, and how can they meet the demands placed on them in a dynamic and fast paced work environment?

Research suggests that when employees view the environment as highly political, they tend to learn just enough to satisfy what they perceive they need to learn in order to satisfy the demands of their supervisors (Volpe 1992). As Volpe found, employees feel the need to protect themselves from ongoing threats of downsizing and outsourcing. The perceived lack of job security inhibits free exchange of ideas and information, restricting collaboration and cooperation in work groups and teams and causing the breakdown of informal networks as vehicles for learning (Marsick & Watkins, 1997; Skiba, 1999; Volpe, 1992; Walker, 2001).

Ipe (2003) points to the importance of trust as foundational to sharing knowledge and communicating, particularly when this involves informal relationships. Informal learning through such relationships is dependent on the culture of the work environment. As several theorists underscore, such learning is strongly influenced by the workplace environment, the context in which people work (Agashe & Bratton, 1999; Boud & Middleton, 2003; Gorard et al., 1999; Walker, 2001). Relationships, upon which trust is built, are precarious at best in the wake of globalization. Trust is considered critical in knowledge management and communities of practice because of its central role in the building and sharing of social capital (Lesser & Prusak, 2000, drawing on Nahapiet & Ghoshal, 1998). The building of social capital, and its underpinnings of trust, is likely to be critical in informal and incidental learning as well.

Informal learning is often serendipitous and is described as taking place anywhere there are other employees chatting over coffee, at staff and group meetings, and working in teams (Candy & Crebert, 1991). It may involve reaching out to the person in the next cubicle and cultivating relationships by networking, coaching, and mentoring. But such learning has also been influenced greatly by technology. Weintraub (1998), for example, investigated the informal learning strategies, processes, and outcomes of a sales division in a large, technology-savvy corporation. Weintraub found that "while the study focused on how technology plays a role in on-the-job learning, in many instances the problem to be solved was learning the technology itself, and that drove the need to learn" (p. 91). Earlier studies also identified learning strategies for using technology (Cahoon, 1995; Woldesenbet, 1998). Knowledge management was nascent at the time of Weintraub's study, which focused on desktop technologies, and the organization he studied focused extensively on building databases that professionals could use to meet work and customer needs, but an "emphasis on sharing and learning from real experience" was lacking (p. 146).

Informal learning can be supported by widespread access to Internet resources such as search engines, websites, and blogs, as well as other forms of electronic information, but questions can be raised as to whether the organization's culture, rewards, structure and practices support learning as well as "getting the job done." In some ways, technology has brought with it a new openness to informal learning because of the amount and

types of information available and the different ways that younger employees have been both socialized and "schooled." Strocchia (2003), whose study was conducted later than Weintraub's and in smaller companies that were also technology-savvy, found that Internet searches were critical to the innovation and learning in three small entrepreneurial firms in Venezuela. But equally as important were informal, interpersonal interactions that helped "innovators to create new ideas, to challenge the current way of solving problems, and to learn competencies" (p. 244). Surprisingly, to Strocchia, who assumed that informal learning would be used more than formal learning, "in the technological field, formal education has a fundamental role in keeping up with technological change" (p. 243). As Weintraub found, the culture and climate were critical to learning and to innovation, but in this case, the three organizations in Strocchia's study fostered "communication, freedom, emotional expression, and autonomy to think and act" (p. 234).

Finally, research involving the assessment of informal learning and its impact on work outcomes is sparse. Fuller et al. (2003) analyzed four regularly conducted national surveys and two one-off surveys in England that purport to assess learning as well as training. Surveys still focus primarily on training and education; an exception is the 2001 National Adult Learning Survey that collected information about both taught and self-directed learning. The authors concluded that "survey evidence on learning is uneven," in part because observation is needed to understand "other forms of learning activity—such as watching, working and learning from others" (p. 33). Fuller et al. also conducted interviews with key informants and prepared case studies of four organizations (hair-dressing salon, accountancy practice, primary care trust, and car dealership) to identify links between informal learning in the workplace, product market strategies, and business performance that they might subsequently test in a survey. As will be discussed later in this chapter, indicators used to measure informal and incidental learning at work are in their infancy but promising research focuses on conditions that affect workplace learning (Skule, 2004) and/or learning culture (Watkins & Marsick, 2003).

In fairness, challenges in measuring learning of any kind, formal or informal, are great. It is difficult to isolate the effects of learning as an intervention from other influences on work outcomes, and therefore, to link learning causally to impact. As Raelin (2000) points out in discussing evaluation of work-based action learning interventions, one *can* "establish an intervening effect between the program and financial results" and then look at links between the intervention and the intervening effect, and between the intervening effect and other results, financial or otherwise." Raelin illustrates this approach with a study done at Sears by Boudreau and Ramstad (1997) that looked at relationships between leadership development and employee attitude change, which in turn could be linked to customer satisfaction. Raelin also suggests that one could look at links between reflective practices in programs, known to influence group development, and then examine links between products of action learning groups that are effective and financial indicators. Because of challenges in evaluating outcomes attributed to learning, some workplace scholars are turning to theory-driven evaluation (Chen & Rossi, 1994) that charts and measures anticipated outcomes along a causal chain; and to assessing strategic value contribution to the business rather than trying to prove return-on-investment (O'Driscoll, Sugrue, & Vona, 2005).

Critique and Re-Conceptualization of the Model

Both a review of research and reflection upon our own experience of informal and incidental learning led to the realization that the model requires a fundamental re-

conceptualization—due in part to limitations of earlier thinking, but also due to trends in theory and practice that necessarily influence the conceptualization of the informal and incidental learning process. Identified problems with the original model can be summarized as follows:

- The model “looks” linear, with beginning and ending points, even though that was not the intent.
- The model “feels” cognitive.
- The model focuses on individual learning within the context of workplaces.
- The model engages context but does not explain the role of context in learning.

Before turning to each of these criticisms and to theory and research that help elucidate how the model needs to be re-conceptualized, Watkins and Marsick turn to reflections on their own experience of informal and incidental learning that illustrates these four basic problems (see Box 20.1).

Although Watkins and Marsick did not distill the lessons of experience into the four key critiques of the original model explored in this chapter, looking back at the story of how they used the informal and incidental learning process, we can tease out elements of each of these reasons for revising our understanding of the informal and incidental learning process in the workplace in the grounded experience of our collaborative writing.

First, even though it was not intended that the model be presented or used in a linear manner—a problem seen in other models such as Kolb’s (1984) experiential learning cycle—the positioning of the model using Dewey’s problem solving cycle tends to make the process look and feel linear. Learning often began with a disjuncture, such as the need to drastically reduce the number of pages of the manuscript or to speak in one voice to a specific audience. But the actual process of learning about the context of the work—the target audience, the objectives of the effort, prior experience, and new realities—comprise both inspirational insights and painstaking research, some of which seem relatively sub-conscious until ideas are driven to the surface through hours of conversation, often to meet particular deadlines or for the purpose of discussing ideas with other audiences. Learning is more iterative than linear.

Second, learning can be stimulated by frequent experiences of the arts (or nature or physical activity or rest) and by the space allowed for breaking the frame of thinking so one can return to work with the ability to step outside of prior frameworks that constrained deeper understanding of the phenomena being addressed. The best work may occur in the most surprising settings.

Third, intense collaborative work itself led to the understanding that the model focused far too much on the individual. What may appear to be individual accomplishments are often the result of interactions with many others, ranging from the most closely involved to those at several degrees of separation. The model does not adequately theorize the socially constructed learning and knowledge that frequently characterizes informal and incidental learning at work. The model still takes the individual as the unit of analysis, rather than the social units that collectively learn as all participants grapple with mutual interests and problems.

Fourth, the 1999 update of the model focused on the pervasiveness of context, but it did not draw out implications for what context entails. As individuals learning to collaborate, Marsick and Watkins had constructed an environment that supported and fed their collective learning, complete with structures for furthering the work (conference

Box 20.1 Re-Thinking the Model Based on Our Experience**Karen E. Watkins & Victoria J. Marsick**

We realized that we had only to look at our own learning to identify problems with the informal and incidental learning model. We began to reflect on how we learned to write collaboratively. How did we come to think together, to work out differences in points of view, and to agree on key points that we wished to develop in our work? As we looked back, we could see an evolution in our capacity to write and work collaboratively that was often triggered by jolts in our environment.

We began work together in writing our 1990 book on informal and incidental learning. Our process, at first, was to carve out two halves of the book—one on informal learning with three case examples all written by Victoria as lead author; and the other half about incidental learning with three case examples, all written by Karen as lead author. A disjuncture in our own experience challenged us to re-think the way the book had been written. The challenge came in the form of a publishing take-over when we were suddenly faced with the realization that our manuscript was about a third longer than the new guidelines allowed.

Since increasing the page length of the book was not possible, we began the process of cutting the manuscript. Each of us soon realized she could not cut her own work enough to meet the requirement. We began cutting the other's favorite prose—ruthlessly. We both believe that this was the best thing that ever happened to that book. It was extremely difficult to do within such a short time frame—but it taught us more about how to write together than anything that we had done to that point.

When we decided to write a second book, *Sculpting the Learning Organization: The Art and Science of Systemic Change* (Watkins & Marsick, 1993), we realized that the book would have to read as one voice. This time we discussed our ideas and presented together on the topic. As we spoke of our emerging ideas at conferences, classes, and workshops, our conversations and dialogue with others, both informal and formal, influenced our vision. We interviewed people who said that they were creating a learning organization, and we read everything in sight. We compared what we heard, in all our conversations, with what we read or heard, debated, and had written with one another.

We again divided the outline into sections—with each taking the lead on a given chapter. We read books on sculpting and watched a video in which Henry Moore talked about his art. We decided to go to the Elisabet Ney Museum—a museum about the work of this gifted sculptress and about the art of sculpting. On some level that we could not well articulate, we were clear that sculpting was a significant metaphor that could capture what we wanted to convey about the art and science of systemic change. Throughout our collaboration, art and music breaks were a constant theme. These breaks allowed space for creative juices to flow and inevitably, because of our focus on sculpting, enabled us to do what Schön (1983) had described as “seeing as” (p. 182).

As we look back at learning to write collaboratively, we see that we were learning informally about learning organizations and about sculpting, even as we were learning incidentally about becoming one voice. We followed the problem solving process outlined in our earlier model, but missing from that model were very important elements of the process—how ideas were continually changing through the interpersonal processes of talking and listening to one other, to those with whom we worked, and to those whom we “heard” in print. Similarly, the critical role played by art in helping us to see in a different way is missing in the earlier model. While that fits with our original ideas about creativity as an enhancer, we had conceived of creativity more in terms of personal qualities than in terms of what is now considered aesthetics as a way of knowing. Through the metaphor of sculpting, we were able to convey an idea that was still preverbal for us.

presentations, time set aside for thinking and writing together), a culture of learning that honored each other's work and learning style preferences and family/work commitments, and rewards and incentives to support joint work. Moreover, as scholars steeped in organizational change and learning theory, they had taken for granted that culture, structures, practices, and incentives/rewards were essential to informal and incidental learning, whether of individuals, groups, or the entire organization. But the model fell short of spelling out the kinds of things that eventually found their way into the substance of their later writing on the learning organization (Watkins & Marsick, 1993, 1999). The model also did not include how to diagnose and address the learning culture that is needed to support group and organizational learning.

Reviewing Theory and Research to Reconstruct the Model

These four challenges led to further exploring theory and research to help reconstruct the 1990/1999 model of informal and incidental learning. A search for new insights followed the revised understanding of the learning they sought to understand. Marsick and Watkins were joined by co-authors Callahan and Volpe in this exploration. The process has been messy, non-linear, driven both by systematic search and by accidental surprise, shaped by social interaction with colleagues and clients, and punctuated by forays into the non-rational and intuitive domains captured through aesthetics and artistic ways of knowing.

Non-Linear Work and Learning Approaches. Implicit learning, like incidental learning, occurs without the learner's awareness. An early example of this was Hamel (1998) who observed that college-to-work transitions via temporary employment were naturally evolving processes, as "apprentices" both learned workplace culture and acquired job skills. The current stream of inquiry into implicit learning in workplaces of all kinds is frequently associated with studies of expertise, tacit knowing, innovation, and organizational learning (Argyris & Schön, 1996; Gleespen, 1997; Kuchinke, 1996; Nonaka & Takeuchi, 1995; Raelin, 1997, 2000). Through tacit learning, people construct the mental, emotional, and interpersonal frameworks for processing all of their experience into knowledge. Unlearning and new learning can occur when frameworks are adjusted or reconstructed to accommodate new experience that does not fit old models. At one extreme, implicit learning and tacit learning can equate to the very basic, even primitive, inputs that might by-pass conscious thought altogether. At the other extreme, such learning includes the abstractions that allow human beings unconsciously to negotiate complex rule-governed signals from the environment (Reber, 1989), which bombard us frequently, often simultaneously, and even contradictorily. Some researchers concentrate on the formation or recognition of attitudes in their discussions of implicit learning, as do Argyris and Schön (1996) in describing the mechanisms of action science. However, as Seger (1994) pointed out, implicit learning also includes the acquisition of skills and habits, again as these result from non-conscious experience or observation.

Seger's (1994) overview of this segment of cognitive psychology was an attempt to sketch the contours of a unified theory of implicit learning. She reported her own research, principally concerning how implicit learning operates within the human nervous system. She acknowledged the elusive nature of the phenomenon—that it is "not fully accessible to consciousness...more complex than a single simple association ...does not involve processes of conscious hypothesis testing" (p. 164) and that many issues are controversial, such as the exact organic mechanism whereby implicit becomes explicit knowledge (p.

188). Nevertheless, she was able to certify that incidental learning truly exists, because it survives amnesia. Seger's conclusion that the preponderance of findings—her own and others'—reveals that, "in the face of strongly held explicit beliefs, knowledge gained through implicit learning is disregarded" (p. 189), is arguable. Reber (1996), for example, is a leader among theorists who hold that implicit learning is more robust and more durable than explicitly mastered skills and beliefs.

Cleermans (1995) echoed the call for more research about the role of implicit learning in training, assessment, and knowledge elicitation, which is central to the design of expert systems. He also provided a clear statement about the relationship between implicit and incidental learning. Implicit knowledge (1) tends not to be expressible through free recall, (2) is associated with incidental learning conditions, (3) gives rise to a phenomenal sense of intuition, and (4) remains robust in the face of time, psychological disorder, and secondary tasks.

Use of Emotion and Intuition along with Cognition. Goleman (1995) catalyzed awareness of the role that emotions and emotional intelligence plays in work lives. Neuroscientists have likewise broken ground through brain research in debunking the myth that emotions have no place in rational decision making (Damasio, 1995; LeDoux, 1996). Some intimations of the non-cognitive aspects of informal and incidental learning were documented in dissertation findings reviewed in our earlier work. Woldesenbet (1998) found that experts were both motivated and rewarded by recognition and gratitude from their associates. Laverdure-McDougall (1998) found that Native American participants were inspired by a sense of empowerment through informal learning. Finally, Shih (1997) explored the influence of internal non-cognitive drivers, such as mission, values, and personality in triggering a learning search.

Yorks and Kasl (2002) have developed a theory of whole-person learning that bears on what can be learned from implicit/tacit learning theory. They build on the work of Heron (1992) and Heron and Reason (1997, 2001), who use this thinking as the basis for the practice of learning through collaborative inquiry. Yorks and Kasl make the distinction between experience as a noun, i.e., the object of cognitive analysis via learning, and experience as a verb, i.e., the act of learning within experience.

For Heron, the affective is the psychological basis for experiential knowledge. He makes a useful distinction between "feeling" and "emotions," two words often used interchangeably. Heron (1992) refers to feeling as the capacity for participating in wider unities of a whole field of experience. This is distinct from emotion, which is defined as the intense, localized affect that arises from the fulfillment or frustration of individualized needs. Feeling is the phenomenological grounding for the meaning that people eventually make of their experience by conceptualization through reflection and the resultant discrimination. Experiential knowledge is thus considered a pre-linguistic form of knowing gained "through participation in, and resonance with, one or more beings in the unified field of being" (p. 162). For Heron, experiential learning is pre-conceptual, "acquiring knowledge of being and beings through empathic resonance [sic. and] felt participation" (p. 224). Feelings and the experiential knowledge that they hold are brought into awareness through the use of forms of expression that engage the learner's imaginal and intuitive capacities, which connect to new conceptual possibilities. Crossan, Lane, and White (1999) include this pre-conceptual level of communication in their description of learning processes central to learning that individuals do, but that can be shared and communicated with groups and the organization. Their four learning processes—intuiting, interpreting, integrating, and institutionalizing—begin with experience, images, and metaphors as prelude to interpretation via conversation and

integration through shared understanding. At the organizational level, this tacit knowing can be made more explicit and captured in rules, procedures, and systems.

Whole-person learning theory integrates feelings and emotions into the cognitive design of the informal/incidental learning framework. Rather than simply taking emotion as an "object" of analysis, this theory makes it possible to look at feeling/emotion as essential components of learning. Tacit/implicit learning can be understood and made evident through what Heron and Reason (2001) describe as presentational knowing: dramatic, participatory, aesthetic, and experience-based formats that convey intuition and tacit knowledge in ways that are precluded by overly-analytic forms of learning.

Aesthetic expression is a way of knowing (Allen, 1995, in Lawrence, 2005) that fits well with informal and incidental learning. Lawrence (2005) asserts that:

making space for creative expression in the adult education classroom and other learning communities helps learners uncover hidden knowledge that cannot easily be expressed in words. It opens up opportunities for adult learners to explore phenomena holistically, naturally, and creatively, thus deepening our understanding of self and the world. (p. 3)

Quoting Allen, Lawrence argues that our earliest ways of knowing are preverbal. What we cannot say in words we can see in our mind as images, colors, or sounds. Dirx (2001) says that we become aware of our emotional states through images. He calls this "soul work."

Like Schön (1983), Lawrence reminds us that experiencing the art of others helps us see anew. Educators can tie their life experience to aesthetic experience in a way that creates affective connections that cannot be expressed in other ways (Olson, 2005). Olson goes back to Dewey's views on art and experience:

Works of art that are not remote from common life, that are widely enjoyed in a community, are signs of a collective life. The remaking of the material experience in the act of expression is not an isolated event confined to the artist and to a person here and there who happens to enjoy the work. In the degree in which art exercises its office, it is also a remaking of the experience of the community in the direction of greater order and community. (Dewey, 1934, p. 81, quoted in Olson, 2005, pp. 62-63)

Some of the earliest work on incidental learning occurred in communication theory where scholars explored the unintended consequences of viewing television and film (Stokes & Pankowski, 1988). What makes aesthetic theory interesting at this time is that much art (especially more abstract or impressionistic forms) intends to provoke multiple subjective interpretations. As workplace educators create learning cultures, much of their work is symbolic, creating messages through visions, slogans, posters, quiet spaces and gathering places, and nonverbal means. These aesthetic means of communication provide a core sense of the organization's direction, and simultaneously, allow each person to differently interpret how to reach this goal. Weick (2001) argues that a significant role of leaders is to shape the salience of information. Artful, pithy messages signal what is important without constraining action.

Learning in Collaboration with Others. Informal/incidental learning at work is increasingly understood as socially situated and socially constructed. Research by Oxford (1998), using informal observation as well as interviews and learning measurement instruments, found

several instances where team perspectives resulted in new collective knowledge. Gleespen (1997) reported the importance of organizational climate to the formation, effectiveness, and content of relationships and networks that support learning. Cahoon (1995) reported the role of mutual problem solving and coaching by peer experts based on negotiated explicit and implicit rules in mastering computer skills. Larson (1991) used interviews, critical incidents, and observations to uncover the role of relationships, storytelling, and task performance with partners among a group of paramedics. These informal learning studies clearly identify the importance of other people and groups in learning.

Wenger (1998) provides a useful theoretical framework for understanding such learning in his discussion of communities of practice. His social learning theory speaks to the way in which people make meaning of their lives and construct their identity by participation in social practice in natural communities tied by common interests:

The concept of practice connotes doing, but not just doing in and of itself. It is doing in an historical and social context that gives structure and meaning to what we do. In this sense, practice is always social practice.

Such a concept of practice includes both the explicit and the tacit. It includes what is said and what is left unsaid; what is represented and what is assumed. It includes the language, tools, documents, images, symbols, well-defined roles, specified criteria, codified procedures, regulations, and contracts that various practices make explicit for a variety of purposes. But it also includes all the implicit relations, tacit conventions, subtle cues, untold rules of thumb, recognizable intuitions, specific perceptions, well-tuned sensitivities, embodied understandings, underlying assumptions, and shared world views. Most of these may never be articulated, yet they are unmistakable signs of membership in communities of practice and are crucial to the success of their enterprises. (p. 47)

Wenger explains many of the dynamics of communities of practice using three core concepts: engagement (to create and maintain the community), imagination (which is central to learning), and alignment (which involves social interaction). Wenger argues that "Engagement, imagination, and alignment are all important ingredients of learning—they anchor it in practice yet make it broad, creative, and effective in the wider world" (pp. 217–218). He adds that reflective practice emerges from the joining of engagement and imagination. Among other things, "Imagination enables us to adopt other perspectives across boundaries and time, to visit 'otherness' and let it speak its own language" (p. 218). When alignment combines with imagination, continues Wenger, people can "align our activities" and "understand why" because it is clear that what we do contributes to a larger vision that is meaningful to the community. "Imagination thus helps us direct our alignment in terms of its broader effects, adapt it under shifting circumstances, and fine tune it intelligently" (p. 218).

These three factors—imagination, engagement, and alignment—enhance our understanding of social reflective learning. They add the following to our model: 1) an understanding of how valuing difference enriches social learning; 2) a deepened appreciation of the social context for learning; and 3) respect for the challenges involved in aligning viewpoints as meaning is negotiated within the social context.

Interaction with Context for Sense- and Meaning-Making. Early and later studies emphasize the role of context in influencing sense- and meaning-making in informal learning. Context comprises both the particular situation in which individuals find themselves,

but it can be extended out to include the broader organizational context, with its culture, structures, processes, and practices. Menard (1993) found that 74% of learning incidents were triggered by crises, both personal and combat, among female Vietnam veteran Army nurses. Lo (1996) found that an environment rich in opportunities for on-the-job training, observing others, and document resources supported learning in a Taiwanese not-for-profit organization. Maben-Crouch (1997) emphasized the role of context-based non-routine problems to stimulate reflection and new learning. Foy (1998) reported that organizational support was the most important facilitating factor in continuing professional education by certified management accountants. Weintraub (1998) concluded that the context—the organization's culture and specific stimuli, internal or external, for learning—is key to framing strategies, processes, and outcomes of learning. A culture not conducive to reflection led to an inability to capitalize on the way salespeople used technology to solve job-related problems. Moran (2003) studied 26 team members at a unionized manufacturing plant in the Northeast, many of whom were not English speakers and some of whom were not highly literate. The organization's hierarchical culture made it difficult to change to a team-based plant. Informal learning was relied upon by interviewees despite that fact that "team members had concerns about the competence of other team members, thought that the supervisor restricted information, and believed that informal learning strategies were discouraged by the organization" (p. i). Likewise, Chartrand (2004) found, in a qualitative study of financial advisors who learned to become collaborative team members, that informal learning occurred despite cultural norms in the financial services industry that reward individual accomplishment.

Callahan (1999) identified the critical role of context in a study of 82 critical incidents provided by 16 participants coming from divergent professional cultures who worked together to create innovative new businesses in a publicly-funded small business incubator in Georgia. She showed that incidental learning helped to bridge professional cultures (entrepreneurs, investors, and the incubator's professional staff). In addition to functional learning to achieve mastery in work performance, she identified bridging learning, comprised of both the exertion and the result of conscious and unconscious efforts to enhance empathetic understanding of another's meaning, to bridge professional cultures and jargon to share meaning. For example, Callahan found that members of all three professional groups at the business incubator referred to "karma in the walls and halls"—identifying a real, if intangible, asset of the environment, experienced as a distinctive electricity in the atmosphere, associated with the inhabitants, facilities, and activities of the center. Participants generally agreed that the "karma" exerted an influence, particularly by encouraging them to work even harder and more creatively. One entrepreneur remembered feeling buoyed by the successes of other members and noting that observing other start-up companies at the business incubator gave him a "virtual blueprint" that provided some guidelines until he was able to create his own business plan. Another environmental factor was the influence exerted on incubator inhabitants and activities by elements beyond the economic development center, such as individuals, institutions, and political, economic, social, or demographic forces.

In a study to determine whether two different organizational settings of CPA practice produced substantially different or equivalent learning opportunities of a practicing CPA, Watkins and Cervero (2000) examined three sources of data including a work audit, interviews, and surveys from the principal parties. They concluded that the learning opportunities available in each firm were substantially equivalent, and focused on the organization as a context for enhancing informal and incidental learning—the support,

structures, and incentives in place to promote an individual's informal and incidental learning. As part of the study, they developed an instrument to assess an organization as a supportive context for informal and incidental learning.

Another way of thinking about context is the broader concept of learning network theory (Poell, Chivers, Van der Krogt, & Wildermeersch, 2000; Poell, Van der Krogt, & Wildermeersch, 1999). Learning varies, according to this theory, by the learning interests and preference for key actors (employees, managers, HRD, etc.), mediated by "the negotiation of power among the actors" (Poell et al., 2000, p. 44). The authors propose four ideal types of networks: vertical, horizontal, external, and liberal. Informal and incidental learning takes place, along with formal learning, within three basic strategy configurations across these networks: extended training, directed reflection, or reflective innovation. The authors see this framework as descriptive rather than normative, and helpful in identifying ways to best support learning by key players, including self-directed learners. Recently, Poell, Yorks, and Marsick (2006) have cross-analyzed data from studies of action learning in the United States and of learning projects in the Netherlands with a view to critiquing the theoretical frameworks guiding the respective studies. One outcome is a combined framework that links the power of understanding informal learning projects with the leverage of better understanding organizational contextual support for learning.

Quantitative research has been almost non-existent in the study of informal and incidental learning. Indeed, Skule (2004) argued that indicators used to measure and assess informal learning at work, at both the national and the organizational level, are underdeveloped. Consequently, current frameworks to measure and benchmark learning are heavily biased towards more readily measured formal education and training. Skule's study, designed to correct this deficit, was based on interviews followed by a survey of 1,300 private sector Norwegians and 200 public sector Norwegians. Jobs were classified as learning intensive or learning deprived based on three variables in the survey: a subjective judgment of learning intensiveness, length of learning needed to master the job, and durability of acquired skills. Factor analysis and theory-based reasoning was then used to identify six key learning conditions: high degree of exposure to change, high degree of exposure to demands, managerial responsibilities, extensive professional contacts, superior feedback, management support for learning, and rewarding of proficiency. Using at best small samples or mixed methods, other studies have sought to measure various aspects of informal learning including creativity (McCracken, 1998) and participation in informal and incidental learning activities by an accountant (Watkins & Cervero, 2000). A recent web-based study examined individual and joint blogging as a form of reflection (Hammond, 2006).

Studies of self-directed learning have been more quantitative—including participation in self-directed learning (see Candy, 1991), and many studies using a validated Self-Directed Learning Readiness Scale developed by Guglielmino (1978). (For a bibliography of research validating this scale, see <http://www.guglielmino734.com/newpage3.htm>.) Econometric models estimating informal learning at work have also been developed (Carnevale, Meltzer, & Gainer, 1990). Even in this sub-area of informal learning, research has been more often descriptive focusing on the learning process used by adults engaged in learning projects or the nature of the learning (reflective or transformative) during self-directed learning. Research in this area verifies that a significant portion of working adults learn on their own, often for work-related purposes, and this learning is aided by skills in learning how to learn and reflection and access to knowledgeable people and resources.

One of the reasons that there have been few quantitative studies of informal and incidental learning is that by their less predictable nature, they are hard to measure. While one can readily identify ways that people learn informally and to a lesser extent ways that people learn incidentally, the learning process itself is less clear. What is learned is so ubiquitous and sometimes even pre-verbal as to be extremely difficult to measure. Where researchers might be able to do additional research is in the affective experiences of individuals engaged in informal and incidental learning. Related to this is recent brain research that looks at individuals in a state of flow (Csikszentmihalyi, 1991)—a state which the author describes as “the way people describe their state of mind when consciousness is harmoniously ordered, and they want to pursue whatever they are doing for its own sake” (p. 6). Given the self-directed nature of informal and incidental learning, one might hypothesize that it is similar to engaging in any other creative task, hence brain activity may also be similar. Finally, research into the organizational support for informal and incidental learning is greatly needed. Work by Watkins and Marsick (2003) using a validated measure of a learning culture, the Dimensions of a Learning Organization, has contributed to a growing body of work in this area.

Conclusions

Revised Model of Informal and Incidental Learning in the Workplace

A review of experience, theory, and research led us to conclude that a two-dimensional model of informal and incidental learning is not sufficient. Such learning in the workplace is *not* primarily focused on and managed by the individual. Nor is it linear, rational, cognitive, or a-contextual. The basic problem solving and learning cycle depicted in the earlier model through which most people move is still relevant, but it is often a loose framework within which many learners interact in the pursuit of a mix of individual and organizationally-determined goals. Individuals seem to be more self-motivated, self-reliant, and self-directed in setting and reaching goals, and in finding opportunities for learning that aids performance and their own personal agendas. But the context of organizations—culture, structure, processes, practices—plays a key role in enabling or inhibiting the motivation, time, resources, expectations, and rewards for learning.

Perhaps a better analogy for thinking about informal and incidental learning is an amoeba-like process, multi-dimensional in nature, consisting of iterative cycling back and forth among phases of the process—with frequent forays into conversation, work with other people, and exploitation of a wide array of resources, often Internet-based or technology-driven, that provide new stimuli for further inquiry. Typically, the learning process includes an element of collective learning as work groups struggle together to solve a problem or sail forward to creatively address a new challenge. Collective work is increasingly the norm in organizations that acknowledge the value of virtual teams, dispersed across locations, and networks or communities that support learning. Learning is often intertwined with action and sometimes semi-conscious at best. Reflection can take place before, during, or after action. While reflection aids such learning, it can also sometimes embed error into the learning process when it is private or more subjective than evidence-based (Marsick & Watkins, 1990). Finally, the learning is often so intrinsic to action that it remains unarticulated and preverbal, yet evident in the actions taken by individuals and groups.

Such a dynamic process is hard to capture in a model. It looks more like a group of players on a soccer field. All players have individual roles but they also work together in different ways toward their goals. Expert players have internalized tacit knowledge and

know the rules. But imagine how different this would look were it more like a group of toddlers on the soccer field—moving as a collective in a sometimes random, sometimes purposeful manner—hitting the ball more often through luck than skill. Their movements are aided through coaching and knowledge about the rules of soccer, but for most of them, these rules of engagement remain abstract and hard to implement in the moment. Similarly, workers engaged in learning as a part of work are often aware of the elements and steps of self-directed learning, but the exigencies of their context are more salient. Our role as workplace educators is to develop ways to build into that context structures and facilitating resources that are sufficiently rich to enable learners to find what they need more readily. Learning has to be the karma in the walls and halls.

Critique and Implications

In organizations, the need to understand informal and incidental learning has grown along with interest in flexible, high performing organizations whose leaders are challenged to take more responsibility for their own and their team's learning, as well as learning by the organization as a whole. Employees are increasingly expected to be self-directed in their learning in order to keep up with rapid changes in knowledge and the knowledge economy. Depending on the company, and on an individual's status/level, learning may need to occur outside of work hours and be paid for by employees. Much lifelong learning in organizations increasingly takes place on the job, sometimes in structured ways, sometimes via growing reliance on coaching and on action learning (Raelin, 1997, 2000), and often supported with technology. An increase in the variety, unfamiliarity, and scope of information sources complicate work. Formerly routine operations have become more non-routine, calling for judgment that may require further learning. Learning demands are magnified by speed and performance pressures. Practical questions arise as to whether and how informal and incidental learning can or should be managed or facilitated; how informal and incidental learning at work intersect with the idea of lifelong learning especially in today's knowledge economies (Faure, 1972); and whether or not trends toward credentialing have led to a decline of informal learning (Gorard et al., 1999).

The fast-paced environment has made learning through day-long or multi-day seminars a luxury, along with other learning experiences that support reflection and/or practice of skills during the work day. Many in the workforce have never attended any of the formal training programs that used to be so prevalent. Smaller companies and non-profit organizations have never been able to provide extensive formal learning opportunities. Some organizations retain training curricula or company universities, but the trend is toward blended and e-learning solutions and learning on the job, often targeted toward specific task performance. Many organizations do not believe there is sufficient return on investment for extended learning opportunities. It appears that efficiency and short-term payback are guiding principles in decisions about training. However, these criteria may not provide employees with all of the learning they need for maximum development (Bloom, 2006; Gill-Webber, 2005). The lack of extensive formal learning programs has increased exponentially the reliance on informal and incidental learning, even when structured training might better prepare employees for their work challenges. Information and knowledge are widely dispersed, but channels for gaining and sharing may be inadequate, as may be the support for learning provided by the organization's culture.

Gorard et al. (1999) observe that "much valuable and non-trivial learning already goes on, and has always gone on, outside formal programmes of instruction" (p. 437).

However, they also point out that informal learning continues to be undervalued in favor of credentials even though this age is characterized as a knowledge era and as a "learning society." In many ways, informal learning is a powerful yet taken-for-granted resource that appears to be deployed only by default. In this regard, Boud and Middleton (2003) point out that "[i]nformal learning is often not acknowledged as learning with organizations. It is typically regarded as being 'part of the job' or a mechanism for 'doing the job properly' and is thus rendered invisible as learning" (p. 194). We have found few direct recommendations in the literature reviewed around a) how organizations can be influenced to view and appreciate the power of informal and incidental learning as a vital mechanism in achieving organizational objectives, and b) how informal and incidental learning can thus become institutionalized without becoming formalized.

The role of workplace educators, in the face of these challenges, may be to pay as much attention to organizational supports and barriers to learning as they do to learning processes and strategies. Some organizations seek frameworks—e.g., communities of practice, social networks, virtual teams, knowledge or learning networks—and strategies that support informal and incidental learning; while other organizations have not aligned structures, processes, and culture in ways that consistently support learning through work even though task demands seem to require this. IBM, for example, which pioneered earlier work on Instructional Systems Design for improved training and development, has recently moved to an On Demand Learning framework that retains some structured education (Work Apart Learning) but relies even more heavily on informal learning catalyzed by work needs (Work Enabled Learning) and incidental learning in the moment to support performance (Work Embedded Learning). Mechanisms have been introduced that aid in such learning, such as After Action Reviews and Quality tools that provide mechanisms for driving out error and for continuous learning.

The implications for organizations are to find ways to create safer, yet stimulating, environments that prize collaboration over competitiveness; focus on helping employees develop transportable skills, including learning skills; and enhance employees' competencies so they become more in charge of their careers and less reliant on the organization. It is that very reliance that can pit employee against employee in the scramble for scarce resources in the modern organization. Perhaps the organization, particularly its leaders, on some conscious or unconscious level, either encourages this tension among employees, ignores it, or neglects it.

Further Research

As we conclude our review, we draw attention to several areas of needed research. Callahan (1999) notes that research on informal and incidental learning has been largely qualitative case studies focused on the types and nature of informal and incidental learning. There are few large-scale studies that draw on what is known to examine the depth and scope of such learning within or across companies and industries. Future research might include intervention research aimed at learning what works to enhance this type of learning.

Deci and Ryan (2000) have broken ground in understanding intrinsic and extrinsic motivation for self-directed learning. Motivation studies of this kind would benefit informal and incidental learning. Such learning depends primarily on individual capability and interest in proactively using opportunities at work to build knowledge and skills. External rewards may not be motivating, and may even be de-motivating. Deci and Ryan point out that "the only necessary 'reward' for these (intrinsically motivated) behaviors

is the spontaneous experience of interest and enjoyment that accompanies the activity itself. Curiosity, exploration, and wonder are all aspects of intrinsically motivated learning" (p. 77). Reio, Petrosko, Wiswell, & Thongsjkmag (2006) and Reio and Callahan (2004) have studied curiosity in adult learning, based in part on dissertation research by Reio. Studies in this vein as well can deepen our understanding of the conditions for supporting informal learning even though it is not highly designed.

We do not yet understand how to support informal and incidental learning without making it artificial or destroying it with too many rules and regulations, although a comparative case study of 11 best-practice organizations by the American Quality & Productivity Center (2001) around how organizations build and sustain communities of practice provides helpful guidelines that can be extrapolated to informal and incidental learning. Watkins and Cervero's (2000) work also leads us to explore what conditions, resources, and policies in the workplace support or squelch informal and incidental learning. Given the importance of context, research might more specifically address the role of organizational leaders in designing and updating learning contexts, including physical and symbolic settings, hiring and reward practices, providing learning models, multi-faceted communications, and work assignments. Although challenging to study, what more can we discover about how power and politics influence informal and incidental learning? A step in this direction is post-modern studies of U.S. organizations such as that conducted by Boje (1994, 1995) or the application of Foucault's power concepts to understanding power dynamics that affect learning in Korean companies that embrace Western-imported learning practices even though their hierarchical culture may conflict with decentralized approaches to self-directed and peer learning (Kim, 2003).

Kim's study moves into different cultural definitions and understandings of learning. Yet, little is known about cultural differences in informal and incidental learning. For example, what is the impact of individualistic versus collectivistic traditions or culturally divergent senses of time on informal and incidental learning? Even though the effects of globalization and multi-culturalism have been discussed for years, disciplined research to understand these realities in terms of the entire informal and incidental learning cycle, and particularly, of learning contexts is needed.

Research is needed to increase our knowledge of the impact of new distributed working arrangements (including telecommuting, outsourcing, and use of contingency workers) on informal and incidental learning in workplaces. Finally, further research is needed on measures of informal learning and assessment of its impact on work outcomes. Better measures would improve surveys that are now more attuned to training than informal learning. New assessment tools are needed to help individuals and organizations understand, document, and manage informal and incidental learning. A promising avenue for assessment research is the measurement of learning conditions and learning culture.

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