

TO WHAT EXTENT CAN WORKPLACE LEARNING BE MEASURED

RICHARD DOUGLAS, PH.D.
CENTRE FOR LABOUR MARKET STUDIES
THE UNIVERSITY OF LEICESTER

JUNE 22, 2008

To What Extent Can Workplace Learning Be Measured?

Introduction

“The least of learning is done in the classrooms.” This quote, attributed to Thomas Merton, reminds us that valuable learning takes place in many locations beyond the traditional classroom. But to what extent can this learning be measured? To explore this question, this paper will address several related questions:

1. What is workplace learning?
2. Why is workplace learning important?
3. What is workplace learning measurement?
4. Who measures workplace learning?
5. How is explicit learning measured?
6. How is tacit learning measured?
7. How does workplace performance contribute to measuring workplace learning?

Collectively, examining these sub-questions helps explore the central thesis regarding measuring workplace learning.

What is Workplace Learning?

“Workplace learning” can be defined as “...learning or training undertaken in the workplace, usually on the job, including on-the-job training under normal operational conditions, and on-site training...” (Australia Department of Education, Employment, and Workplace Relations, n.d.). This definition frames learning as something sought on purpose, like Eraut’s (2000) deliberative learning, but ignores tacit learning, “...the acquisition of knowledge independently of conscious attempts to learn....” (Reber, 1993).

Workplace learning experiences take many forms, including instructor-based (classroom or via the internet), technology-based (computers, simulators, the internet), and self-directed (including independent study, on-the-job training, coaching and

mentoring, job aids, and learning contracts) (Piskurich, Beckschi, & Hall, 1999). Additionally, employees learn from performing their work (Fuller, Hodkinson, Hodkinson, & Unwin, 2005). It can even take a hybrid form, where the training consists of a “front end” of formal classroom training, followed by a period of on-the-job training (Hager, 2004a). Regardless of the method, training represents an investment by both the employer and employee. Measuring workplace learning can help determine not only the effectiveness of training, but also the return on investing in it (Phillips & Stone, 2002).

Why is Workplace Learning Important?

Employers benefit from their workers’ learning. Organizations whose workers are also learners gain....

“...in three ways. It raises skill levels and, through the process of learning itself, can help organizations respond to change; the successful firm of the future will know ‘how’ to learn as much as ‘what to learn. It also increases the knowledge base of the organisation, which is essential to discovery and innovation.” (Secretary of State for Education and Employment, 1998, p. 33)

In the performance management field it is often said, “What gets measured gets done.” (Hale & Whitlam, 2000, p. 5). These measures help identify what needs to be done and compare workers’ performance to employers’ expectations. By extension, employees pursue learning in the workplace that is measured.

The human resources development (HRD) profession has a stake in measuring learning. While some organizations treat training and development as an expense to the

enterprise, “HRD learning is an integral component in maintaining the effective operation of many organisations.” (Smith, 2004)

Workers who are also learners are more likely to be “engaged,” well connected to the organization and its mission. As the Gallup Corporation has established with its extensive research in the workplace, there is a strong connection between employees’ development and their feeling of engagement to the organization and its mission (Wagner & Harter, 2006). Affirmative answers to questions like “Is there someone at work who encourages my development?” and “In the last year, have I had opportunities to learn and grow” correlate strongly to organizations who perform better and have stronger business results. Measuring this learning helps ensure it is taking place, and to what extent.

Donald Kirkpatrick began developing a model for evaluating workplace training programs in 1959, going on to publish his book on the subject in 1975—and periodically updated, the latest with his son (Kirkpatrick & Kirkpatrick, 2006). In it, four areas, or levels, of measurement are offered:

Level 1, Reaction, describes the process of gathering feedback from training participants regarding their impressions of the course or event. While these reactions are valuable in terms of refining the training process, they are not designed to measure participant learning.

To what extent participants accomplished the learning goals of the course or training event is the domain of tests and measurements, occupying Kirkpatrick’s Level 2, Learning.

Transferring Learning to Workplace Performance—and measuring it—is another key reason for learning in the workplace. Kirkpatrick referred to this as

Level 3, Behavior. “In other words, what change in job behavior occurred because people attended a training program?” (Kirkpatrick & Kirkpatrick, 2006, p.52) More difficult than merely measuring what the worker learned, it is also more valuable to employers.

By measuring workplace behavior changes resulting from workplace learning, employers are more likely to see positive business-related results. Kirkpatrick called this Level 4—Results. “...the most important and perhaps the most difficult part of the process, you decide—determining what final results occurred because of attendance and participation in a training program.” (Kirkpatrick & Kirkpatrick, 2006, p. 63) When workplace learning occurs, it can be measured indirectly by changes in the metrics the organization uses to measure its success. *This is true even if there was no attempt to measure the individual workers’ learning—it may be implied by changes in the organization’s performance in its key areas.*

Another key element to the importance of workplace learning is that it is continuous and ongoing; it is not limited to the brief periods of time spent in the classroom. It is dynamic, evolving along with external and internal changes to the organization and its workers (Hager, 2004b). As such, knowing that workplace learning is taking place to meet these changes is vital, while identifying and measuring it is difficult.

Finally, workplace learning is important in order to determine whether or not the employer’s investment in the learning process was warranted—were the costs of supporting workplace learning justified by the financial gains realized in the effort? If

the costs and benefits can be quantified, the ratio—“return on investment”—can be calculated (Phillips & Stone, 2002).

Who Measures Workplace Learning?

Exploring workplace measurement depends in part on determining who measures it, how they measure it, and to what extent. There are several parties that measure workplace learning, each with their own approaches.

Employees measure their own learning during and after they receive training in the workplace. They express their satisfaction—or dissatisfaction—regarding their learning experiences. They may also be asked to grade their own learning as it relates to the course objectives, a before-and-after assessment of their progress. Also, employees may be asked in follow-up surveys to what extent they were able to apply the things they learned in training while performing their jobs trainers (Kirkpatrick & Kirkpatrick, 2006).

It should be noted that there are limitations to the self-reporting methods described above. Training participants are subject to overstating or understating the learning they have accomplished (Sullivan & Hall, 1997).

Trainers and Training Organizations also measure learning. In the workplace classroom, trainers measure learning by giving their charges examinations, asking them to demonstrate knowledge and skill via performance, even engaging them in conversations that reveal training participants’ command of the concepts being taught. And training organizations follow up with their course participants to determine whether—and to what extent—training participants use their knowledge and skills in performing their jobs (Phillips & Stone, 2002).

Mentors measure the learning experienced by their charges, whether the learning events are structured or are “intangible.” (Le Mastre, Boudreau, & Pare, 2006)

Employers measure workplace learning in distinct ways. They measure workplace performance (Hale & Whitlam, 2000) which, in turn, indicates workplace learning has taken place. Employers actively engaged in managing their companies or organizations also look to metrics—performance related measures that indicate the organization’s effectiveness and performance (Software Engineering Institute, 2008). Kirkpatrick (2006) called this Level 4, Results. Questions like these are considered:

- “How much did quality improve....?”
- How much did productivity increase....?
- What reduction in turnover....?
- What tangible benefits have we received....?” (p. 63)

How is Explicit Learning Measured?

Sfard (1998) compared two metaphors useful in discussing learning experiences: acquisition and participation. She described the acquisition metaphor containing”many terms that denote the action of making [learning] one’s own: reception, acquisition, construction, internalization, appropriation, transmission, attainment, development, accumulation, grasp.” (p. 5). Put in a different way, learning goals are identified; learning is then acquired by the learner. This metaphor requires that the desired learning already be identified (so it can be sought). The learning must be “explicit.”

Explicit learning, also known by other terms like “formal” and “structured” learning (Centre for Labour Market Studies 2004), implies a discernable, thought-out

learning process, planned for ahead of time and easily identified and measured. It “...is characterized as an active process where people seek out the structure of any information that is presented to them.” (University of Winnipeg, n.d.) Eraut (2000), using the term “formal learning,” suggested that any of the following characteristics present in the learning experience placed it in the formal (explicit) domain:

- A prescribed learning framework
- An organised learning event or package
- The presence of a designated teacher or trainer
- The award of a qualification or credit
- The external specification of outcomes (p.114)

The United States Air Force (2002) requires the use of specific instructional systems design methods contained in a model called “ADDIE.” (p. 6) The five steps described in ADDIE are:

1. Analyze and determine what instruction is needed.
2. Design instruction to meet the need.
3. Develop instructional materials to support system requirements.
4. Implement the instructional system.
5. Evaluation is a central function that takes place in every phase.

It is in Step 1, Analyze, where the learning goals must be identified—and upon which the training design will be based. This aligns with Eraut’s (2000) criteria for explicit learning and becomes the basis for measuring the workplace learning taking place in such training events. (It is during Step 3, Development, where the evaluation methods for the training event are created.)

Mager (1997) described how to design criterion-referenced learning objectives based on stated learning goals. These objectives described what the trainee will be able to do, know, or feel once the training event has occurred. Each objective:

- “is related to intended outcomes
- is specific and measureable, and
- is concerned with students, not teachers (p. 3)

Ideally, each objective will be made up of three components: the behavior to be performed, the conditions under which it is to be performed, and the standard to which it will be performed. Beneficially, these objectives also become the basis for measuring the trainee’s performance; explicit learning is thus measured by simulating performance conditions, observing behavior, and measuring it against the stated standards.

Benjamin Bloom offered a taxonomy and, thus, further refinement of the “behavior” to be measured:

- Cognitive: mental skills (Knowledge)
- Affective: growth in feelings or emotional areas (Attitude)
- Psychomotor: manual or physical skills (Skills) (Clark, 2007)

These behaviors, once identified, can be measured in a variety of ways, including formal tests, performance testing, simulations, exercises, activities, self-assessment, and trainer assessment (Phillips & Stone, 2002), which can take place in the training room or on the job.

Phillips and Stone (2002) also describe the importance of measuring workplace learning, including:

- Increased emphasis on knowledge, expertise, and competence

- The importance of learning as a change agent
- The need for the transfer of learning to the job (p. 86-89)

However, Bersin (2007) found that as little as 35% of organizations use explicit learning measures. Measuring workplace learning is important, but in many cases it is not being done.

Measuring explicit workplace learning is difficult, but it is only part of the issue.

There is another domain of learning that occurs and can be measured.

How is Tacit Learning Measured?

“We have “...a power to know more than we can tell,” (Polanyi, 1976, p. 336)

There is knowledge to be learned that cannot be (or, as yet, has not been) identified, what Polanyi calls “implicit learning.” It is also referred to as “tacit” learning (Stover, 2004), which is the term used throughout most of this paper.

Returning to Sfard (1998), one may examine learning that takes place in the “participative” metaphor, described as learning that takes place by workers participating in (experiencing) work activities. Eraut (2000) described this kind of learning “implicit” (tacit), taking place in “informal” learning activities (p. 115). This learning, harder to define, anticipate, train towards, and measure, nonetheless occurs whenever employees engage their roles in the workplace.

Employers value the tacit learning that occurs through workplace experiences participated in by their employees (Paloniemi, 2006). Experienced workers discuss their learning from these experiences, while less-experienced workers anticipate such experiential learning in the future.

Rather than keeping informal and formal learning separate, it can be said that they are interrelated, that “there are significant elements of formal learning in informal situations, and elements of informality in formal situations; the two are inextricably inter-related.” (Malcolm, Hodkinson, & Colley, 2003, p. 313) This interrelatedness informs us that informal (tacit) learning is pervasive and should be acknowledged—and measured. Inferred from the authors’ criteria for determining the formality or informality of learning, tacit learning (in part)...

- takes place in the community and/or workplace
- is less intentional, planned, and structured
- *is less frequently measured* (emphasis added)
- is less time-bound
- is less context-specific and more generalizable
- is not part of a course
- is more affected by teacher-learner relations
- is more androgogical in its approach
- tends to meet the needs of marginalized groups
- has the locus of control of the learning process centered within the learner, not the organization (Malcolm et al., 2003, pp. 314-315).

Eraut (2004) divided informal learning into three types, one of which he called implicit (tacit) learning, contrasting it with reactive and deliberative learning, placing all three on a continuum (in that order) based upon how intensely the learner linked past experiences with present ones, and how much the learner plans and has expectations about future learning opportunities. The tacit learner does not consciously link past

memories with current experience, and has typically unconscious expectations about future learning opportunities.

In the workplace, tacit learning is used naturally. For example, one learns the norms of the organizational culture by experiencing it. (Eraut, 2000) While many expectations and prohibitions are documented, not all are. This applies to individuals as well. For example, one might learn, after leaving several messages and e-mails, that a particular co-worker is most responsive and available in face-to-face encounters. Not documented anywhere, and something one might not contemplate greatly, but valuable tacit knowledge nonetheless.

Another example is the university experience. Becker (1972) imagines a university course on the subject of being a university student. Rather than focus on an academic subject matter, this author imagines a hypothetical course teaching students what they really need to succeed in their university experience: interpersonal interactions with faculty, test-taking skills, easy courses for good grades, and the locations of the best pubs.

Senge (2006) says, “The most powerful learning comes from experience.” (p. 26) His intent was to acknowledge that so many important things learned—to walk, to speak, etc.—come from trial and error and without serious contemplation regarding the learning method(s) being employed by the learner. And McAdam, Mason, and McCrory (2007) offer “epitomes” of tacit knowledge, where tacit knowledge appears in concepts such as intuition, “know-how,” and beliefs.

If tacit learning exists, if it is pervasive in the workplace—even in formal learning setting— and if it is valuable knowledge to use, can it be measured? This is a difficult question:

“One of the main reasons why there have been very few attempts to empirically research tacit skills is that it is problematic. Research instruments such as surveys and structured interviews are likely to be inappropriate insofar as individuals cannot be asked to state what they cannot readily articulate.” (Ambrosini & Bowen, 2001, p. 812)

Several methods are available to us, but they are not found where the practitioner would normally look. It is surprising to find the major figures in measuring workplace learning—Josh Bersin (2008), Jack Phillips (2002), even Donald Kirkpatrick (2006)—not only do not prescribe methods for measuring tacit learning in the workplace, they do not even mention that it exists.

Returning to Ambrosini and Bowen (2001), the authors provide a continuum describing the “degree of tacitness” in workplace learning. This structure, from low to high degrees of tacitness is:

- A. Explicit skills
- B. Tacit skills that could be articulated
- C. Tacit skills that can be imperfectly articulated
- D. Deeply ingrained tacit skills (p. 816)

How tacit learning may be measured can be explored using this continuum as a guideline.

Explicit Skills—those that are clearly articulated and communicated—can be measured using the methods described earlier in the discussion of Kirkpatrick’s Levels of

Evaluation. However, it is worth noting that even in the use of explicit skills, tacit skills can be found. As such, tacit learning can be measured. To do so, the measurement must closely resemble the actual workplace to challenge the worker to demonstrate the whole skill, not just the “classroom” skill. “Knowing could be characterized as process (*sic*) involving decision making and problem solving, accessing increasing amounts of tacit knowledge located in individual, group, and cultural knowing.” (Poikela, 2004, p. 271)

Tacit skills that could be articulated suggests transforming tacit knowledge into explicit knowledge by identifying, describing, and communicating it. Then it can be measured in the same way other explicit skills are measured (Ambrosini & Bowen, 2001). This process moves knowledge from the unknown to the known. Stover (2004) suggests tacit knowledge can be made explicit and, thus, “codified.” (p. 164) Methods include engaging employees in reflective practice, formal interviews, and interaction with others. (Stover, 2004) However, mere workplace experience does not necessarily imply tacit learning is taking place. Those experiences should be captured, examined, and codified. “Tacit knowledge becomes visible in work practices, not in experience.” (Paloniemi, 2006, p. 447)

Tacit skills that can be imperfectly articulated are those that cannot be described directly. Cognitive maps (graphic representations of a person’s explanation of the world around him or her), causal maps (focused on actions), semi-structured interviews, and metaphors may be used to elicit tacit knowledge (Ambrosini & Bowen, 2001).

Deeply ingrained tacit knowledge is the most difficult to observe and measure—it is intertwined with explicit skills demonstrated in both learning situations and in the workplace (Ambrosini & Bowen, 2001). It is suggested here that such tacit learning is

not directly observable, yet may still be measured: by evaluating workplace performance.

This raises the final sub-question discussed in this paper.

How Does Workplace Performance Contribute to Measuring Workplace Learning?

Measuring workplace performance differs from Kirkpatrick & Kirkpatrick's (2006) Level 3—Transfer. In Kirkpatrick's model, the explicit learning identified and attempted during the training process is observed being put to use in the workplace. But tacit learning is unidentified during the training process; trainers looking for Transfer would not know to look for this unidentified learning.

The use of performance appraisals in the workplace is common. For example, Clarke (2004) found that 91% of health care organizations surveyed reported using them.

A typical performance management system contains:

- Performance Planning—setting performance expectations for the employee
- Ongoing Performance Communication—providing continuing feedback on employee performance
- Data Gathering, Observation and Documentation
- Performance Appraisal Meetings—end-of-period reporting
- Performance Diagnosis and Coaching (Bacal, 2008)

A performance management system cannot possibly describe everything an employee must know and be able to do to succeed in his/her job. For many aspects, managers make what seem to be intuitive judgments about job performance; they know it when they see it. Competencies may be identified, and employees may be measured against them, but neither the description nor the observations provide the complete picture. For example, evaluating a teacher considers many aspects not codified in the

evaluation process—tacit skills and knowledge. The items on the evaluation form or checklist do not comprehensively capture the performance. As Becker (1972) noted, an evaluator knows a good teacher when he or she sees one.

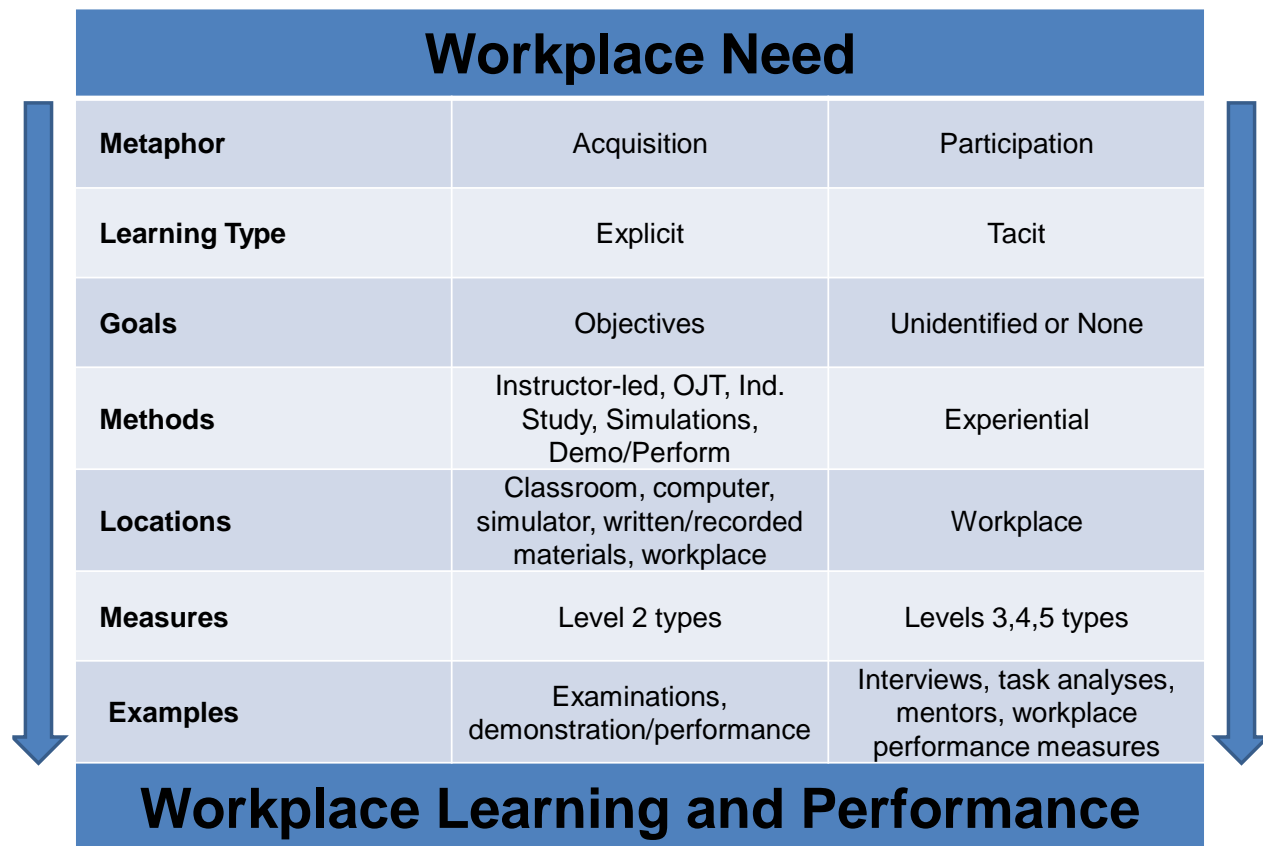
Evaluating workplace performance provides a holistic, complete measure of both the explicit knowledge transferred to the job, and whatever else it takes to perform the job successfully. This leads to the over-arching question posed at the beginning of this paper:

To What Extent Can Workplace Learning Be Measured?

Workplace learning can be measured to a great extent, regardless of the type of learning being measured. Explicit learning, derived through the acquisition metaphor, is based on pre-determined learning goals and objectives. The learning activities undertaken are purposeful, focused on “acquiring” this learning—which occurs in the classroom as well as the workplace. It can be measured with methods designed and aligned with the intended learning, like examinations, case studies, simulations, etc. Figure 1 depicts this process.

Tacit learning, by definition, evades description, but may still be measured. Workers, through the participation metaphor, develop it through their experiences in workplace learning and performance on the job. Tacit learning can be measured through observation, largely through workplace performance measures. Again, Figure 1 shows this process.

Figure 1, Workplace Learning Model



Conclusion

Through a series of questions designed to explore the various elements of workplace learning, this paper set out to describe to what extent it can be measured. The conclusion—that it can be measured to a great extent—stems from the ability to measure both explicit and tacit learning, embracing both the acquisition and participation metaphors for workplace learning.

The scope of the paper lightly touches on the subject. So much can be—and has been—written on the subject of measuring workplace learning. Also, these concepts

were examined from an individual learner's perspective. The way an organization learns can and should be measured as well (Senge, 2006, Garvin, 1993).

Learning in the workplace occurs, whether intended or not. It can be measured, either directly by examination or indirectly through measuring workplace performance. Ultimately, it is the transfer of workplace learning into workplace performance that benefits employers and employees alike.

References

- Ambrosini, V., & Bowen, C. (2001). Tacit knowledge: Some suggestions for operationalization. *Journal of Management Studies*, 38(6), 811-829.
- Australia Department of Education, Employment, and Workplace Relations (n.d.). *Glossary*. Retrieved June 1, 2008, from http://www.dest.gov.au/sectors/training_skills/policy_issues_reviews/key_issues/nts/glo/utoz.htm
- Bacal, R. (2008). *Performance management and appraisal help center*. Retrieved June 19, 2008, from <http://performance-appraisals.org/faq/whatcomponents.htm>
- Becker, H. S. (1972). A school is a lousy place to learn anything in. *The American Behavioral Scientist*, 16(1), pp. 85-106.
- Bersin, J. (2008). *The training measurement book*. San Francisco: Pfeiffer.
- Centre for Labour Market Studies (2004). *Workplace learning: Module 2A*. Leicester, UK: University of Leicester.
- Clark, D. (2007). *Learning domains or Bloom's taxonomy*. Retrieved June 16, 2008, from <http://www.nwlink.com/~Donclark/hrd/bloom.html>
- Eraut, M. (2000). Non-formal Learning and Tacit Knowledge in Professional Work. *British Journal of Educational Psychology*, (79), 113-136.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education*, 26, 247-273.
- Fuller, A., Hodkinson, H., Hodkinson, P., & Unwin, L. (2005). Learning as peripheral participation in communities of practice: A reassessment of key concepts in workplace learning. *British Educational Research Journal*, 31(1), 49-68.

- Garvin, D. A. (1993). Building a learning organization. *Harvard Business Review*, July/August 1993, pp. 78-91.
- Hager, P. (2004a). Front-loading, workplace learning and skill development. *Educational Philosophy and Theory*, 36(5), pp. 523-534.
- Hager, P. (2004b). Lifelong learning in the workplace? Challenges and issues. *Journal of Workplace Learning*, 16(1/2), pp. 22-32.
- Hale, R., & Whitlam, P. (2000). *Powering up performance management: An integrated approach to getting the best from your people*. Hampshire, UK: Gower Publishing Company.
- Kirkpatrick, D. L., & Kirkpatrick, J. D. (2006). *Evaluating Training Programs* (3rd ed.). San Francisco: Berrett-Koehler Publishers.
- Le Mastre, C., Boudreau, S., & Pare, A. (2006). Mentor or evaluator? Assisting and assessing newcomers to the professions. *The Journal of Workplace Learning*, 18(6), pp. 344-354.
- Mager, R. F. (1997). *Preparing instructional objectives* (3rd ed.). Atlanta, GA: CFP Press.
- Malcolm, J., Hodkinson, P., & Colley, H. (2003). The interrelationships between informal and formal learning. *Journal of Workplace Learning*, 15(7/8), pp. 313-318.
- McAdam, R., Mason, B., & McCrory, J. (2007). Exploring the dichotomies within the tacit knowledge literature: Towards a process of tacit knowing in organizations. *Journal of Knowledge Management*, 11(2), pp. 43-59.

- Paloniemi, S. (2006). Experience, competence and workplace learning. *Journal of Workplace Learning*, 18(7/8), pp. 439-450.
- Phillips, J. J., & Stone, R. D. (). *How to measure training results*. New York: McGraw-Hill.
- Phillips, J. J., & Stone, R. D. (2002). *How to measure training results: A practical guide to tracking the six key indicators*. New York: McGraw-Hill.
- Piskurich, G. M., Beckschi, P., & Hall, B. (1999). *The ASTD handbook of training design and delivery* (2nd ed.). New York: McGraw-Hill.
- Poikela, E. (2004). Developing criteria for knowing and learning at work: Towards context-based assessment. *Journal of Workplace Learning*, 16(5), pp. 267-274.
- Reber, A. (1993). *Implicit learning and tacit knowledge: An essay on the cognitive unconscious*. Oxford, UK: Oxford University Press.
- Secretary of State for Education and Employment (1998). *The learning age: A renaissance for a new Britain*. : Department of Education and Employment: HMSO.
- Senge, P. M. (2006). *The fifth discipline* (2nd ed.). New York: Doubleday.
- Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, 27(2), 4-13.
- Smith, I. (2004). Human resource development - the return on investment. *Library Management*, 25(4), pp. 232-234.
- Software Engineering Institute (2008). *Website*. Retrieved June 15, 2008, from www.sei.cmu.edu

- Stover, M. (2004). Making tacit knowledge explicit: The Ready Reference Database as codified knowledge. *Reference Services Review*, 32(2), pp. 164-173.
- Sullivan, K., & Hall, C. (1997). Introducing students to self-assessment. *Assessment & Evaluation in Higher Education*, 22(3), 289-305.
- University of Winnipeg (n.d.). *Implicit and explicit learning*. Retrieved June 16, 2008, from <http://io.uwinnipeg.ca/~epritch1/impnexp.htm>
- Wagner, R., & Harter, J. K. (2006). *12: The elements of great managing*. Washington, DC: Gallup Press.