Management Learning

Learning-Network Theory: Organizing the Dynamic Relationships between Learning and Work

Rob F. Poell, Geoff E. Chivers, Ferd J. Van Der Krogt and Danny A. Wildemeersch

The online version of this article can be found at:

Published by:

$SAGE Publications

Additional services and information for *Management Learning* can be found at:

Email Alerts: http://mlq.sagepub.com/cgi/alerts

Subscriptions: http://mlq.sagepub.com/subscriptions

Reprints: http://www.sagepub.com/journalsReprints.nav

Permissions: http://www.sagepub.com/journalsPermissions.nav

Citations (this article cites 20 articles hosted on the
SAGE Journals Online and HighWire Press platforms):
http://mlq.sagepub.com/cgi/content/refs/31/1/25

Rob F. Poell, Geoff E. Chivers, Ferd J. Van der Krogt and Danny A. Wildemeersch

University of Nijmegen, The Netherlands and University of Sheffield, UK

Learning-network Theory
Organizing the Dynamic Relationships Between Learning and Work

Abstract   *This study presents a theoretical perspective on organizing learning networks in relation to work processes within organizations. Despite the potential wealth in combining various learning and work arrangements, the field seems to be characterized by a single-minded pursuit of highly uniform ways to organize learning and work. The learning-network perspective rejects both a functionalist tool of management approach and a context-independent organizational learning view. Instead, it demonstrates how learning networks are (re-)produced by interactions among employees, managers, training consultants, and other actors, who each have their own theories and strategies in organizing work-related learning. Learning networks can take various shapes depending both on actor dynamics and on work characteristics. The learning-network theory is a descriptive theory that allows employees, managers, training consultants, and other learning actors to understand and develop alternative ways of organizing employee learning in relation to work. An indicative rationale for the key differences between the learning-network perspective and some rival approaches is provided.*

This study presents a theoretical perspective on organizing learning networks in relation to work processes within organizations. The learning-network perspective rejects both a functionalist tool of management approach and a context-independent organizational learning view. Instead, it demonstrates how learning networks are (re-)produced by interactions among employees, managers, training consultants, and other actors, who each have their own theories and strategies in organizing work-related learning. Learning networks can thus take various shapes depending both on actor dynamics and on work characteristics. Our argument is built in three steps.

First, an overview is offered of current issues in the field of work-related learning. Learning has become increasingly important to the survival of organizations in recent years, as a result of various changes both in the context of companies and within organizations. This growing awareness of the need for learning has also yielded a wide variety of alternatives to formal training arrangements that can contribute to individual and team learning.

Second, recent developments in the field are criticized for being too narrowly focused in several respects. The emphasis on learning carries with it the risk of creating a new 'learning elite', especially because learning tends to be viewed solely as functional for work. Further criticism concerns the fact that employees are frequently disregarded as (co-)organizers of their own learning processes. Moreover, despite the potential wealth in combining various learning and work arrangements, the field seems to be characterized by a single-minded pursuit of highly uniform ways to organize learning and work.

Third, therefore, in order to enable a more multifaceted picture of organizing learning in work contexts to emerge, a frame of reference offered by the learning-network theory (Van der Krogt, 1995, 1998) is presented. This is a descriptive theory that allows employees, managers, training consultants, and other learning actors to understand and develop alternative ways of organizing employee learning in relation to work. We conclude by providing an indicative rationale for the key differences between the learning-network perspective and some rival approaches.

Current Issues in Organizing Work-related Learning

The Increasing Importance of Learning for Organizations

The field of learning in work organizations is changing at a steady pace. On the one hand, this is due to the rapid changes in work and in the way work is organized. Organizations frequently call upon their learning systems to enable such changes. For instance, management can introduce new employee development schemes or structured on-the-job training programmes to accompany technological innovations. On the other hand, learning systems also have a dynamics of their own, independent of work changes. For instance, by benefiting from the work experience of their colleagues, employees can learn to work more efficiently, which has an impact on the way they organize their jobs.

One overarching conclusion that everyone in the field seems to support is the claim that learning becomes more and more important for the survival of present-day organizations. Exactly what is meant by this assertion remains subject to different interpretations. Some believe that organizations as such are capable of learning, by improving the communication between their members (Argyris and Schön, 1978) or by disseminating new knowledge among all employees. Knowledge has come to be regarded as a key asset of employees, their ability to readily acquire and use it a core competence. From the organizational point of view, creating and sharing new knowledge is crucial for innovation processes (Nonaka and Takeuchi, 1995; Ayas, 1996). Others would rather say every organization learns if it manages to survive in whatever way for a longer period of time (Wijnhoven, 1995; Easterby-Smith, 1997).

The notion of a learning organization, although a very ambiguous concept itself (Poell, Tijmensen and Van der Krogt, 1997), has become a popular term to stress the

importance of learning for organizations. A recurring theme in this debate is the urge for companies to facilitate learning at the individual, team, and organizational level (e.g. Senge, 1990; Simons, 1990; Dixon, 1994). Especially teams are being put forward as crucial contexts for organizing both learning and work (e.g. Benders and Van Hootegem, 1996; Vennix, 1996). Product innovation teams have been presented as powerful sources for organizational learning (Ayas, 1997). Apparently, modern organizations cannot afford not to be learning in one way or another.

Changes in Work Organizations Calling for Learning

The growing importance of learning for organizations' survival is usually attributed to an organizational world becoming increasingly complex and knowledge based, with technological changes following each other ever faster and markets getting more and more dispersed (Otte and Schlegel, 1992; European Commission, 1996; MOCW, 1998). At the organizational level, these rather abstract developments are translated into new structural shapes. Large organizations have flattened their structure in an attempt to become less bureaucratic, which should encourage the adoption of innovations and lead to better communication with the markets served. Employees have come to bear work responsibilities that were in the hands of line managers or support staff before, a process referred to as empowerment (Andrews and Herschel, 1996). As a result, their jobs have become broader and more complex. The work organization is no longer characterized by a strong Taylorist task division. People's jobs are now less individualistic and more semi-autonomous team based (Mai, 1993; Bouwen and Fry, 1996; Hoogerwerf, 1998).

Employees have also become more and more responsible for their own learning, in order to ensure their employability (Bloch and Bates, 1995; Filipczak, 1995; MOCW, 1998). Organizations now expect employees to be flexible and adaptable at work, certainly against the background of increasingly flexible contracts. And not only should employees be learning continuously to perform new and changing tasks, they should also learn how to learn efficiently (e.g. Smith, 1990; Simons and Zuylen, 1995; Onstenk, 1997). It seems that learning and changing have to become second nature for modern employees.

Not only has learning in work organizations become increasingly important, learning that was formerly considered to be independent from the labour market has gradually been vocationalized (Hickox, 1995). As a result of macro-economic and demographic changes, growing attention is paid to educating and training the unemployed (Manninen, 1996; Murphy, 1996). Sectors of the labour market experiencing a scarcity of qualified employees, such as the information technology branch, feel forced to hire and train less or 'wrongly' qualified personnel. The field of adult education is increasingly focusing on work-related qualifications instead of liberal or more general topics (Hake, 1995; Dirkx, 1996). The andragogical concept of the study circle has been introduced into organization development (Höghielm and Gougoulakis, 1995). Changes in the nature of qualifications required from employees have even meant that certain areas of learning formerly understood as personal growth, such as self-efficacy, self-reflection, communication and group skills, are now being embraced by organizations as seemingly relevant contributions to modern working life (e.g. van Zolingen, 1995; Davis and Miller, 1996; Finger, Jansen and Wildemeersch, 1998). To summarize, the domain of work and organiz-

ation has in a way, mainly as a result of economic strain, colonized fields of continuing education that appeared to be much less vocationally oriented before.

Multiple Ways of Organizing Learning

At the organizational level too, economic factors seem to influence the way learning is organized. Whereas a decade ago, off-the-job training efforts were highly characteristic of the field, nowadays training is increasingly delivered on the job, in the workplace (Jacobs and Jones, 1995; Glaudé, 1997). On the one hand, organizations find it less costly to have employees trained while remaining part of the production process. On the other hand, on-the-job training is also thought to prevent problems of training transfer (Broad and Newstrom, 1992) and thus enhance organizational innovation.

Other ways than formal training arrangements to organize learning are also gaining attention, usually with a view to integrating learning with work (e.g. Fox, 1997). Methods like action learning have been applied in the world of organizations for quite some time now (e.g. Revans, 1980; Boutinet, 1986; Boutinet and Jobert, 1987; Watkins and Marsick, 1993; Gregory, 1994; McAdam, 1995; Raelin, 1994, 1997; Mumford, 1997). Job coaching and mentoring have become more accepted ways of organizing learning in many companies (Locke and Latham, 1990; Brown et al., 1994; Galbraith and Cohen, 1995). Supervision and peer consultation as reflective instruments have spread from social sector institutions to a broader range of organizations and branches (e.g. Driehuis, 1997). The importance of socialization into a community of practitioners is stressed in methods of apprenticeship, which have received new attention (Lave and Wenger, 1991). Methods such as job rotation, job enlargement, and job enrichment are used to improve the quality of working life and also to encourage employees to learn and to be more flexible (Hitchcock, 1994; Cheraskin and Campion, 1996).

So-called 'learning islands' (*Lerninseln* in German) have been developed as physical places for employees to be engaged in group learning (Schneider and Stötzel, 1993). Workplaces are reorganized so as to become more learning oriented (Verdonck, 1993). 'Change laboratories' are introduced for continuous incremental work improvement (Engeström et al., 1996). Especially in large organizations, self-paced training courses in so-called open learning centres have come to replace or supplement trainer directed arrangements, using various multimedia technologies as didactic tools (e.g. Biemans and Simons, 1992). Overall, a lot is expected from the systematic use of modern communication technology to provide all organizational members with the relevant information to make the appropriate decisions in their work, which is also thought to encourage learning at all levels (Wijnhoven, 1995; Roth and Niemi, 1996). Clearly, multiple ways of organizing learning have come into existence over the last decade, although formal training remains a well-known and well-used practice.

A Critique of the Dominant View on Organizing Work-related Learning

So much for an overview of current issues in the debate on work-related learning, as far as they have an impact on the level of concrete organizations. In this paragraph,

various points of criticism are raised regarding the developments taking place in the field and regarding the way these tendencies are predominantly viewed in literature. After that, we will draw on the shortcomings of existing approaches to present the learning-network perspective as an alternative frame of reference.

The Creation of a 'Learning Elite'

Stressing the importance of continuous learning for work is now a common theme. There is the inherent danger, however, of involuntarily creating a 'learning elite' of people who are capable, willing, and demanding to learn continuously. People unwilling or incapable of learning all the time run the risk of becoming second-rate employees, who are responsible for their own possible unemployment (McGivney, 1992; Forrester, Payne and Ward, 1995). The creation of a learning elite is particularly hazardous if it boils down to deepening the present divide between people with interesting high-skilled jobs and those who perform low-skilled tasks. Training efforts aimed at the emancipation of less well educated people have not proved to be very effective (Otte and Schlegel, 1992; Riemer, 1997). It may be far too demanding for large groups of people to be constantly engaged in learning processes and changes, whatever impressive methods may be created to help them achieve new learning. Simply forcing people to keep learning without recognizing the fundamental objections they might have seems unethical and, for that matter, ultimately ineffective.

The Functionality of Learning for Work

This first point of criticism is reinforced by a second, which refers to the strictly instrumental way of looking at the relation between learning and work. Learning is regarded as mainly functional for work. Problems or changes in work are viewed as misfits between work requirements and employee qualifications. Employees have to adapt to new work requirements by gaining necessary qualifications through training. Learning is considered to be a tool of management and should be mainly relevant for work performance. Relevance for employee development is secondary and usually limited to taking into account their learning style and needs within the training programme. The workplace may be incorporated into training programmes as a didactic principle. The participation of employees in organizing learning is limited to the execution of the training programme.

It seems as though when work and organizations change, which they do all the time, people simply have to adapt to these changes by acquiring the necessary qualifications. But work and organizations can also be adapted to people's existing or newly acquired qualifications. It should be recognized that, on the one hand, work innovation and organizational change require from employees an ability to gain new qualifications. On the other hand, however, learning and development as such enable employees to actively shape work and organizations in ways that seem most beneficial to them. The first observation, implying that learning should be relevant for work, is most commonly stressed (e.g. Swanson and Arnold, 1996). The latter, focusing on the empowering features of employee development, builds upon a rich tradition within the fields of andragogy and adult education (e.g. Knowles, 1978; Brookfield, 1986) and has been gaining new momentum over the last few years (e.g. Van der Krogt, 1995, 1998; Wildemeersch, 1995). It is crucial, however, to recognize

the tension between the functionality of learning for work and its own value and dynamics (Finger et al., 1998).

The tendency toward vocationalization, described earlier as another indication for the growing importance of work-related learning, equally bears the danger of losing a critical stance regarding work and organizational change. Organizing work-related learning is more than just seeking to adjust people to their work situation, it also means empowering them to strengthen their own professional and work development. Again, it should be recognized that the tension between these two goals of learning is ever present.

The Disregard of Employees as Organizers of Learning

The main reason for the dominance of the functionalist approach to work-related learning lies in the managerial perspective that strongly characterizes the discipline. Learning and training are mainly viewed as tools of management. Work-related learning is usually referred to in terms of the activities of trainers, consultants, or HRD staff. These actors are regarded as the ones who organize training programmes for the employees, by order of the management and in line with the corporate policy. The training programmes are pre-structured and formalized. Managers perceive HRD and training staff as their loyal servants, in some ways rightly so. The perspective of the employees, their ideas and interests with regard to learning and work, are either ignored or viewed quite instrumentally. This is certainly true as far as employees' participation in learning policy and programme development is concerned (see Riesewijk and Warmerdam, 1988; Feijen, 1992). Learning policy seems to be the sole domain of management, while programme development apparently is carried out by training staff only. Employees seem to be rather passive learners at the receiving end of the line.

Even if the focus should change to open or self-directed learning, this is often understood to mean that employees now have to perform some of the tasks previously in the hands of trainers. Alternatively, new didactic methods are invented to enable employees to efficiently learn what the management wants them to learn (Dirkx, 1996; Davis and Miller, 1996; Burke, 1997). Moreover, due to a traditional emphasis on the strategies of trainers and consultants (McLagan, 1989; Van Ginkel, Mulder and Nijhof, 1994; Bazigos and Burke, 1997), much of the literature still focuses on organizing training courses instead of learning arrangements. The concept of the learning organization suffers from an equally narrow conception of how learning and work should be organized (see Poell et al., 1997). Employees are not regarded as crucial learning actors, who have their own theories and interests as to what they should learn, for what purpose, and in what way. The actions of employees are rather viewed as reactions to the strategies of trainers and managers (Easterby-Smith, 1997). Nevertheless, employees have their own strategies to organize learning (Day and Baskett, 1982). These determine in large part how learning is organized, in interaction with the strategies employed by the management and the training staff.

The Pursuit of Uniform Learning and Work Arrangements

Organizations seem to be implicitly viewed as machine bureaucracies, hierarchical organizations in which employees perform clearly defined tasks and routines. The

management and the work preparation staff design and improve work structures, the employees perform the actual work. Training staff support the management in the implementation of work changes by organizing training programmes for employees. Increasingly, it seems as though all organizations are having to move from a Taylorist to a more team-based organization of work (e.g. Helbich et al., 1993; Mohrman, Cohen and Mohrman, 1995; Boonstra and Steensma, 1996). Organizations are supposed to be doing away with hierarchy and functional divisions. Instead, responsibilities are to be placed as low in the organization as possible. By analogy, learning is to become the prime responsibility of learners within their work team. Various new didactic methods are introduced to help employees adjust themselves to changing requirements by learning. Besides the criticisms already raised above, three further critical remarks are appropriate here.

First, however popular this image of present-day learning and work organizations may be, it is hard to distinguish rhetoric from reality. Although top managers and consultants may applaud the creation of flexible organizational arrangements, existing patterns are often quite persistent (Fruytier, 1994; Cordery, 1996; Dovey, 1997). The organizational reality tends to differ considerably from the ideal pictures painted by management gurus. These images are used by managers to project their theories of learning and work organizations. But employees' projections may be equally valid and, more importantly, they make for an organizational reality quite different from the image dominantly presented. In order for a realistic picture to emerge, all actors' images should be taken into account (Rhodes, 1997).

Second, the dominant image is a fairly uniform one denying the diversity and dynamics within learning and work organizations (Tsang, 1997; Agnew et al., 1997). True, many organizations are trying to de-bureaucratize. But other companies (e.g. care institutions) are making the work structures more bureaucratic and the work processes more top-down. Still other companies strengthen the impact of the professional field on their organization, thereby making work more congruent with external innovations (e.g. information technology companies). So, not only are organizations very diverse by nature, they are also constantly changing. Moreover, there is usually little consensus among the actors about the right direction in which to change. What managers may view positively as empowerment may be regarded by employees as replacing well-known ways of working with no sense of direction. What the management may stimulate as team-based learning may be regarded by employees as just another smart way to do things in the management's way. Boot and Reynolds (1997) argue for using multifaceted concepts such as 'community' and 'network' rather than viewing organizations in terms of groups only. To summarize, instead of replacing one dominant organizational model with a different one that is equally uniform, justice should be done to the diverse and dynamic nature of work organizations and the way learning is organized.

Third, the tendency to reduce the question of organizational change to merely altering a Taylorist to a team-based structure is not necessarily in the best interest of employees. Both Taylorist and team-based work arrangements invite the employees to develop company-specific competencies, whereas they would profit more from developing a broad set of professional qualifications enabling them to perform work in a variety of companies. Employees who are well embedded in their professional discipline have more possibilities to stay employed in interesting jobs. This, however, calls for an organization of work and learning along the lines of pro-
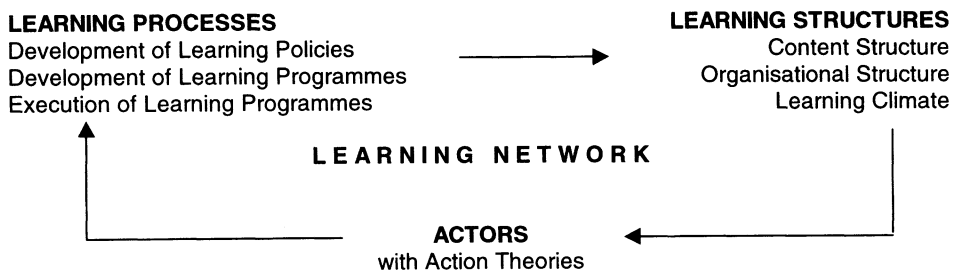
fessional domains (or *Berufe* in German, see Kraayvanger and van Onna, 1985; Arnold, 1994; Kraayvanger and Van der Krogt, 1995). An orientation on the professions, though presently also under pressure in the German context as well, has never gained much popularity in the Anglo-Saxon world. The point made here is not, in view of the previous criticism, to be taken as a plea for all organizations to develop into professional organizations. It is meant as an incentive to look more seriously at the possibilities offered by professional work for organizing learning and work.

The Learning-network Theory (LNT) as an Interpretive Framework

In view of all this criticism that has been raised, there is a need for a theoretical framework that regards organizing work-related learning differently. One that acknowledges employees as central actors who co-organize learning on the basis of their ideas and interests, instead of reducing their participation to being at the receiving end of a training course. One that regards multiple ways of organizing work-related learning not only as a didactic principle, but as an expression of the various organizing strategies used by employees and other actors in order to learn. One that recognizes the immanent tensions between learning and work, between employee development and work performance, instead of viewing learning simply as functional for work. One that reduces the danger of creating a learning elite by enabling people to adjust work to their qualifications as well as to adapt their competencies to work innovations.

In the remainder of this article it is intended to explore to what extent the learning-network theory (LNT) offers an interpretive framework that can meet these needs. Two central questions are investigated. First, how is learning organized? And second, how are the dynamics of learning and work related?

Figure 1   The learning network of an organization

LEARNING PROCESSES
Development of Learning Policies
Development of Learning Programmes
Execution of Learning Programmes

LEARNING STRUCTURES
Content Structure
Organisational Structure
Learning Climate

L E A R N I N G   N E T W O R K

ACTORS
with Action Theories

Source: Van der Krogt, 1995, 1998.

How is Learning Organized?

The LNT (Van der Krogt, 1995, 1998) describes the way learning is organized in the context of work organizations. According to the LNT, a learning network is operating in every organization. Learning networks are not limited to network-type organizations, or to matrix organizations, or to team-based organizations. People learn in every organization, even in a hierarchical one or a chaotic one, and the learning network merely represents how the learning is organized. This concept of a learning network, by the way, has nothing to do as such with computer networks, nor with inter-organizational networks. In the LNT, a learning network consists of the various learning activities organized by the members in the organization. There are three main components to a learning network, which appear in Figure 1.

Actors, Processes and Structures in the Learning Network

The three main components in each learning network are the learning actors, the learning processes that they organize, and the learning structures that they create.

1. Learning actors   At the heart of each learning network are the *learning actors*, that is, those engaged in organizing learning. There are internal learning actors, for instance, employees, training staff, first line managers, top managers, personnel officers. But external learning actors can organize learning as well, for instance, professional associations, trades unions, external HRD consultants and training staff, government authorities. They are referred to as learning actors, because they are regarded as stakeholders who act deliberately on the basis of their own theories and interests with respect to work-related learning. The LNT regards employees who organize primary work processes as central learning actors,[1] who interact with the other actors to organize activities. Learning is considered to occur when actors acquire and develop the relevant action theories. Action theories encompass the norms, ideas and rules that more or less explicitly guide and legitimize people's actions (Argyris and Schön, 1978; Van der Krogt, 1995, 1998), although actors are not always able (or enabled) to act according to their own theories. Actors are likely to have different ideas about which action theories are relevant and to employ different strategies in order to acquire or develop them. For example, whereas managers may think employees should learn to be more customer-oriented by taking an on-line course, employees may rather express a need to gain more product knowledge by contacting fellow employees in other departments. Employees may even feel there is an organization problem, rather than a learning problem, which could be solved by granting them a certain amount of job enrichment.

2. Learning processes   The learning actors interact with each other to organize activities giving rise to three *learning processes*, namely the development of learning policies, the development of learning programmes, and the execution of learning programmes. The development of learning policies refers to influencing the general direction of the learning network, that is, what people should learn and in what way they should learn it. Activities in this process include reflecting on learning needs, discussing the consequences of work innovations, listing available and required competencies, and so forth. The development of learning programmes comprises the

making of coherent sets of activities in which people learn. Activities in this process include, for instance, introducing new work elements, scanning the external training market, creating a problem-solving quality circle, finding ways to let various activities mutually enforce each other. In the execution of the learning programmes people are actually learning. Activities in this process include job coaching, solving difficult work problems, taking on-line courses, asking experienced colleagues for help, receiving work instructions, and so forth.

It is important to note that all actors participate in all three processes, although participation is not always tantamount to action. Deliberately refraining from action, or asking others to represent your ideas in their actions, can also be viewed as a way of participating in a learning process. In reality, some actors are more dominant in some processes, depending on the context in which the learning network operates. For example, trainers dominate the development of learning programmes in a learning network operating under Taylorist work arrangements, whereas individual employees dominate this process in a more liberal learning network alongside self-directed work arrangements.

It should also be clarified that, although the three processes are interrelated, there is no fixed time order in which they should necessarily appear. One model commonly recommended is to develop learning policies first, then to translate these policies in the planning of learning programmes, and finally to run the programmes. For one thing, this rarely happens as intended. But more importantly, other ways of linking the processes to each other seem equally valid. For instance, the experiences gained during a disastrous innovation programme can have a strong impact on learning policies within the organization. Learning programmes can also be developed incrementally as learning activities are taking place, for example when employees are studying a complex work problem for which no solution is easily available. Again, the relationships between the three processes seem to depend on the work context in which they occur.

Finally, it should be noted that within the LNT, concepts such as learning activities, processes, and strategies refer to social-organizational rather than mental operations. This is not to say that mental activities, processes, and learning strategies are irrelevant in work-related learning. Educational psychologists have greatly enhanced our knowledge about mental operations (Levine, Resnick and Higgins, 1993; Oshima, Scardamalia and Bereiter, 1996; van der Sanden, 1997). The LNT, however, focuses mainly on what happens between people as they interact socially, rather than on what takes place within a person's mind.

3. Learning structures   When people have been interacting to organize learning activities over a longer period of time, certain more stable patterns tend to develop. These are termed *learning structures* and can be observed in a certain content structure, organizational structure, and learning climate. The content structure refers to the profile of the learning programmes that are carried out: what is the nature of the learning activities that make up these programmes? Learning activities can be more learner-directed or more facilitator-directed, they can take place on the job or off the job, they can centre around various learning themes. The organizational structure comprises the division of tasks and responsibilities by the various actors in organizing the learning activities: which actor tends to play which role in which of the three learning processes? Who is authorized to do what? The learning climate reflects the

prevailing norms and values with regard to learning in the organization: what are valued qualifications for people to acquire? What are normal ways to go about learning them?

The basic operation of a learning network is described in Figure 1. The LNT assumes that people are competent actors who interact with each other on the basis of their own theories and interests. Thus, they create learning processes that evolve into structures over time. These structural arrangements, which provide the context for organization members to act, in turn influence people's actions but do not necessarily determine them. Actors have choices, up to a certain extent. The LNT specifically addresses this tension between actors' choices and their self-created structural context, or between agency and structure (Giddens, 1984). It tries to avoid both an over-reliance on structural determinism (Donaldson, 1996) and a somewhat naive context-independent action focus (Argyris and Schön, 1978).

Four Theoretical Types of Learning Networks

The LNT distinguishes four theoretical types of learning networks situated in a three-dimensional space. The four types are the liberal, vertical, horizontal, and external learning networks, as summarized in Table 1. The three dimensions are the

Table 1   Four theoretical types of learning networks

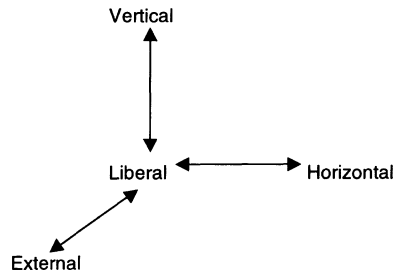|	Learning Networks			
	Liberal	Vertical	Horizontal	External
Learning Processes				
	Single activities	Linearly planned	Organically integrated	Externally co-ordinated
Development of learning policies	Implicit	Planning	Learning	Inspiring
Development of learning programmes	Collecting	Designing	Developing	Innovative
Execution of learning programmes	Self-directing	Guiding	Counselling	Advisory
Learning Structures				
Content structure (profile)	Unstructured (individually oriented)	Structured (task or function oriented)	Open or thematic (organization or problem oriented)	Methodical (profession oriented)
Organizational structure (relations)	Loosely coupled (contractual)	Centralized (formalized)	Horizontal (egalitarian)	Externally directed (professional)
Learning climate	Liberal	Regulative	Integrative	Inspiring

Source: Adapted from van der Krogt (1995, 1998).

liberal–vertical, liberal–horizontal, and liberal–external dimension, as shown in Figure 2.

1. The liberal learning network   In this network, individual employees create their own sets of learning activities. Learning policies remain implicit, at least from the organizational point of view. Programme development is in the hands of the individual employees who set out to create their own relevant learning situations. Learning-programme execution is self-directed as well. The profile of the liberal learning network can be termed as unstructured and individually oriented, since there is little structure above the individual level. The organizational structure is loosely coupled, with contractual relationships based on negotiation between the actors. There is a liberal learning climate in which an entrepreneurial learning attitude is encouraged. Organizations that take the notion of individual employee empowerment (Andrews and Herschel, 1996) seriously are likely to develop a liberal learning network. The notion of employability (Bloch and Bates, 1995; Filipczak, 1995) can equally be regarded as a tendency towards liberalization.

2. The vertical learning network   This network is characterized by linear planning of learning activities. Firstly, learning policies are developed by the management. These are then translated into thoroughly pre-designed learning programmes by HRD and training staff. Finally, the programmes are delivered to the employees, who receive guidance in going through the training activities. The profile of the vertical learning network can be called heavily pre-structured and the learning activities are usually oriented toward the improvement of simple tasks or functions. The organizational structure is centralized and dominated by the management, who keep formalized relationships with other actors. The learning climate can be termed as regulated, since everything that is supposed to happen is laid down in rules and regulations. This vertical learning network is common in many large organizations and, despite the growing unpopularity associated with Taylorism, it still plays a dominant role in organizational reality (Wilson and Cervero, 1997). The way learning programmes are designed in this network bears much resemblance to what Marsh and Willis (1995) refer to as a rational-linear approach to curriculum planning.

3. The horizontal learning network   In this network, the three learning processes are organically integrated as opposed to mechanically planned. Programmes develop incrementally while they are being executed. There are no pre-designed learning policies, these develop by learning from experience as the programmes go forward. Learners are facilitated by process counsellors in the learning programmes that they create along the way. Marsh and Willis (1995) call this an artistic approach to curriculum planning. The profile of the horizontal learning network can be referred to as open or thematic, the learning activities are organization-oriented and aimed at problem solving. The organizational structure is horizontal, with egalitarian relationships among the actors. Groups are the dominant actors. The learning climate emphasizes integration of learning and work as two sides of the same coin. This learning network has gained popularity through the extensive literature on learning organizations, up to the point where a total integration of learning and work in groups seems to be advocated (Senge, 1990). In practice, however, complete integration proves almost impossible and, moreover, hardly desirable as the only option (Poell et al., 1997).

Figure 2   Four theoretical types of learning networks in a three-dimensional space

4. The external learning network   This learning network is co-ordinated from outside the organization, from the professional associations to be more precise. The learning policies are inspired by new developments within the professions of the employees. Learning programmes are really work innovations to be introduced in the organization by the professional field. In the execution of the learning programmes, learners are advised by external actors how they can adapt their work to the innovation. The profile of the external learning network can be called methodical, since it is based on externally developed new work methods. The learning activities are aimed at improving the employees' professional capabilities and work standards. The organizational structure is directed externally, with professional relationships among the actors. There is an inspiring learning climate open to innovations from outside the organization. This learning network, although common when employees have a strong orientation towards their professional field, seems to be more or less under siege, nowadays. Managers find it hard to control and call it inflexible. But many professions are well organized, very much self-sustaining, and quite successful in protecting a strong position. Their popularity with employees seems hardly surprising, since professions usually offer their members more status and job security than the organizations where professionals happen to work (Poell and Tijmensen, 1998).

Dynamics in Learning Networks along Three Dimensions

The LNT assumes that a learning network in any organization displays characteristics of one, or in the common case of hybrid forms, several of the four types described above. The theoretical types serve as a three-dimensional frame of reference for actual learning networks (see Figure 2). Not only can their present position be described, the framework also enables the observation of change in ever-dynamic learning networks. Learning networks can move alongside one or more dimensions, altering over time as actors interact differently.

  The liberal–vertical dimension, then, represents the amount of centralization and regulation in the learning network. The liberal–horizontal dimension stands for the varying focus on group or individual criteria as a context for problem solving and learning. The liberal–external dimension describes how learning networks may be more or less inspired by innovations developed outside the organization. The call for learning organizations can now be understood as a plea to strengthen the horizon-

tal dimension, and the unpopularity of mechanical training networks as a proposed farewell to the vertical type. Empowering the learners can be interpreted as a move toward the liberal type, while externalization obviously refers to strengthening the impact of the professional discipline on the learning network.

Now that we have demonstrated how actors organize different learning networks, it is intended to explore the dynamic relationships between the various learning networks and the way in which work is organized. We start by explaining the basic operation of the labour network, which is similar to that of the learning network. We then distinguish four theoretical ways in which different work processes can be organized. Finally, the tense relationships between learning networks and labour networks are presented. Being able to cope with these tensions is at the heart of what we think is expected from employees, managers, training consultants, and other actors in organizations.

How are Learning and Work Related?

Most actors operate not only in the learning network of an organization, but also in the labour network, which is where the work is organized. The labour network can be described while using the same perspective as the learning network, with a focus on work actors, processes, and structures. The complete picture of the relationship between the learning network and the labour network is shown in Figure 3.

Actors, Processes and Structures in the Labour Network

Work actors are regarded as competent organization members, who organize the work on the basis of their views and interests with respect to work. Work actors include employees, line managers, top managers, work preparation staff, personnel officers, professional associations, trades unions, and so forth. Actors have work action-theories, which represent their ideas about work and the organization of work, and they have learning action-theories, which refer to their views on learning and the organization of learning. Besides learning processes, actors interact with each other to give rise to three *work processes*, namely the development of work policies, the development of work programmes, and the execution of those programmes. Over

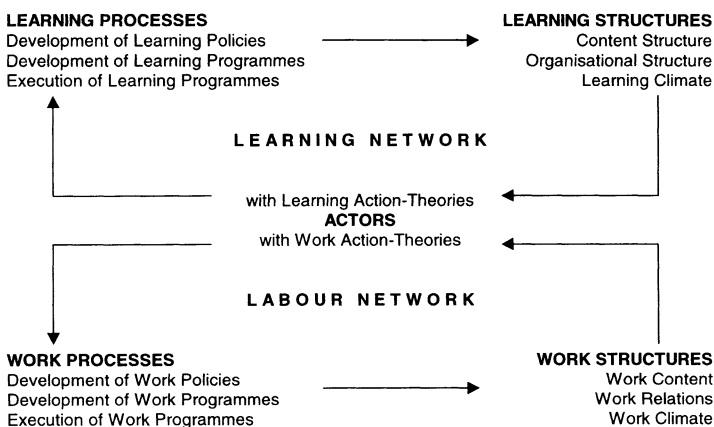**Figure 3**   The learning and labour networks of an organization

LEARNING PROCESSES   LEARNING STRUCTURES
Development of Learning Policies   Content Structure
Development of Learning Programmes   Organisational Structure
Execution of Learning Programmes   Learning Climate

L E A R N I N G   N E T W O R K

with Learning Action-Theories
ACTORS
with Work Action-Theories

L A B O U R   N E T W O R K

WORK PROCESSES   WORK STRUCTURES
Development of Work Policies   Work Content
Development of Work Programmes   Work Relations
Execution of Work Programmes   Work Climate

Table 2   Four theoretical types of labour networks

	Labour networks			
	Entrepreneurial work	Machine-bureaucratic work	Adhocratic group work	Professional work
Dominant actors	Individual employees	Managers/work preparation staff	Multidisciplinary work group	Professional associations
Work content	Broad/simple	Specific/simple	Broad/complex	Specific/complex
Work relations	Contractual	Collective	Team-based	Externally arranged
Work climate	Liberal	Regulated	Organic	Innovative

Source: Adapted from Van der Krogt (1995, 1998).

time, certain more persistent work arrangements come into being, here referred to as *work structures*. The work content describes the activities that make up the work programmes, the work relations represent the division of tasks and responsibilities regarding work, and the work climate reflects the prevailing norms and values with respect to doing the job. The existing structural arrangements influence but do not completely determine the work actions undertaken by the actors.

Four Theoretical Types of Labour Networks

Four theoretical types of labour networks are distinguished in Table 2, namely entrepreneurial work, machine-bureaucratic work, adhocratic group work, and professional work (see Mintzberg, 1979). *Entrepreneurial* work is characterized by a not-too-complex but broad work content, contractual relationships between the actors, and a liberal work climate. Individual employees are dominant actors in this network, negotiation a prime feature of the interaction with other actors. Entrepreneurial work can be found in small and medium-sized enterprises, in large corporations consisting of small self-supporting units, and in any organization where all individual employees have 'their own shop'. The notion of empowerment reflects a tendency toward this type of labour network. *Machine-bureaucratic* work has a simple and narrow work content, collective work relations between the actors, and a regulated work climate. Managers and work preparation staff are dominant actors in this network, which features a great deal of central planning and pre-designed work. This is Taylorist work in its prime form, mostly encountered in large mechanically operating companies, now increasingly losing popularity because of its perceived inflexibility. *Adhocratic group* work is complex problem-solving work with a broad content. Labour relations are group or team based, and the work climate is organic and learning oriented. Autonomous multidisciplinary work groups are the dominant actors in this network, consisting of project teams created to accomplish solutions to problems never encountered before. Many popular visions of the learning organization implicitly refer to this type of labour network, which is then to be integrated with a team-based horizontal learning network. *Professional* work has a highly specialized and complex work content, labour relations are taken care of within the professional associations outside the organization, and there is an innovative work climate. The

professional field is the dominant actor in this network, seeking to inspire organizations with new work innovations that have been developed. The German system of *Berufe* (Kraayvanger and van Onna, 1985; Arnold, 1994; Kraayvanger and Van der Krogt, 1995; Van der Krogt, 1998) is a prime example of this type of labour network, which is usually less popular with managers than with employees.

Dynamics in Labour Networks along Three Dimensions

The labour network in any organization can more or less approach these theoretical types. Labour networks are also characterized by changes over time, as a result of altering interactions between the work actors (see Figure 4). For instance, managers may want to introduce team-based work, or employees may want to strengthen their professional outlook on work. The changes can take place alongside three dimensions, comparable to the ones in the learning networks. Entrepreneurial work can be verticalized to become more machine-bureaucratic, horizontalized to have more adhocratic group-like features, and externalized to show more professional traits. Of course, changes can also occur in the opposite direction or in more than one direction at the same time. This is especially the case when actors have different ideas about the 'best' labour network and when they employ different strategies to get there. A common strategy is to use the learning network for this purpose. This brings us back to the question of the relationship between learning and work.

The Relationship between Learning Networks and Labour Networks

The LNT assumes certain relationships between the learning network and the labour network of an organization. These are summarized in Figure 5. A liberal learning network is likely to be found in entrepreneurial work, a vertical learning network is expected in machine-bureaucratic work, a horizontal learning network is related to adhocratic group work, and an external learning network is most common for professional work.

It is important to observe that these relationships are merely expectations expressing a certain likelihood, based on the fact that actors who organize the labour network are often also engaged in creating the learning network. These actors employ certain strategies to organize learning and work in ways that are most relevant to

Figure 4   Four theoretical types of labour networks in a three-dimensional space
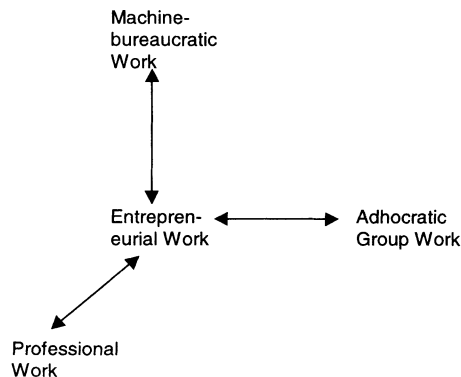
Figure 5 The expected relationships between learning and labour networks

Labour Networks	Learning Networks			
	Liberal	Vertical	Horizontal	External
Entrepreneurial Work	x			
Machine-bureaucratic Work		x		
Adhocratic Group Work			x	
Professional Work				x

them. They use the learning network to bring about changes in the labour network, and vice versa. For instance, managers who want to introduce a new work policy can ask their work preparation staff to design new work programmes and their training staff to run training programmes to enable the employees to perform the work. Trainers can organize structured on-the-job training to strengthen the links between the work and their learning programmes. Employees can reorganize their work programmes informally as a result of what they have learned from their colleagues. These are all examples showing how the learning network and the labour network can mutually influence each other.

Nevertheless, both networks have dynamics of their own as well. The reason for this is twofold. First, actors use the two networks for different purposes. Learning and work are organized to accomplish different objectives, through strategies operating by different principles. These objectives and strategies are also likely to differ from one actor to another. Employees will stress the importance of solving the work problems that they encounter, of their personal and professional development, of their work satisfaction, and of their job security. Managers will focus on team performance, meeting the targets that have to be met in whatever way. In the latter view, learning should be mainly relevant for better work performance, whereas the former emphasizes its relevance for employee development. The different objectives that actors pursue in learning and work provide a first explanation for the tension between the learning and the labour network. For a second reason, the power relations between the actors in the labour network differ from the ones in the learning network. Generally speaking, employees are more powerful in the learning network than they are in the labour network, which tends to be dominated by management and their support staff. Put differently, it is harder to bring other people to learn than it is to have them perform a certain job. A popular notion in this respect is the concept of resistance to change (Judson, 1991), which from the LNT perspective seems to refer mainly to the fact that people tend to have their own views and interests as to how and why they should change (see Hoff and McCaffrey, 1996). Again, it seems harder to force change or learning upon people than it is to have them perform certain tasks.

To take the argument one step further, provoking discrepancies in the expected relationship between a labour and a learning network may be one of the most common strategies used by actors to achieve organizational change. For instance, management can verticalize entrepreneurial work by introducing more standardized simple jobs and have staff design standardized training programmes for the

employees. The LNT would expect the learning network to become more vertical and less liberal as a result, although other actors can prevent this from happening by employing different strategies. To take another example, employees can strive to make the learning network more external by seeking inspiration within their professional associations from newly developed work methods. If they learn to use these methods and change the internal work organization accordingly, the labour network will become more professional. Again, other actors may employ different strategies in order to encourage other directions for change. The point is that the learning network and the labour network are relatively autonomous, in that they are quite independent as far as their own dynamics are concerned, but very much intertwined because most actors play a role in both networks at the same time. To summarize, the LNT does not prescribe what kind of learning network is best suited for what kind of labour network, it merely describes the relationships between the two networks that are likely to be encountered.

Conclusion: An Indicative Rationale for the Learning-network Theory

This study has explored whether the learning-network theory (LNT) meets the need for an alternative theoretical framework of organizing work-related learning, in view of the criticisms raised before. The LNT regards employees as core actors co-organizing learning according to their ideas and interests. It recognizes diverse ways of organizing learning as a product of the different strategies that actors use. It focuses on the inherent tensions between employee development and work performance, between the learning network and the labour network, thereby avoiding sheer functionalism. It acknowledges that people can adapt work to their competencies as well as learn in order to adjust to work innovations. Our conclusion would be that the LNT provides an alternative perspective on work-related learning that is useful to describe both how learning is organized and how learning and work are related. But how does the LNT relate to some of its rival perspectives?

   Compared with other approaches to work-related learning, the LNT is a descriptive and interpretive model of how learning *can* be organized rather than a prescriptive model of how learning *should* be organized. It remains a model, though, that is, an over-simplified version of reality that seeks to clarify major processes and the relationships between them. This particular model is certainly not meant to be a prescription of how things ought to be. It is action based, however, in that it offers actors various organizing options to consider as well as an insight into the dynamics that might occur when certain options are pursued (Poell, Van der Krogt and Wildemeersch, 1998). These dynamics are caused by the fact that different actors use different strategies to relate learning to work, and some actors are more powerful than others in enforcing their particular strategy (Poell, Van der Krogt and Wildemeersch, 1999). Elsewhere, we compared a method to organize work-related learning inspired by our network perspective with other action-based methods (Poell, Van der Krogt and Warmerdam, 1998). We concluded that the network approach is more action based than organizational learning approaches à la Argyris and Schön (1978), but more reflection based than action learning methods à la Revans (1980). Both latter methods, however, are characterized by facilitator intervention rather than the self-direction by learners central to our network perspective.

The LNT combines elements from various disciplines of organizational learning. In terms of the six disciplines distinguished by Easterby-Smith (1997), the learning-network perspective draws most heavily from the discipline of sociology and organization theory, with its emphasis on power and actor interests. The discipline of cultural anthropology is well represented in the central notions of action theories and learning climate.[2] Interestingly, Easterby-Smith concludes that these two perspectives are underrepresented in the field and that more attention to their insights would be beneficial. The discipline of psychology and organization development transpires in a concern for individual development in various organizational contexts.[3] The other three disciplines of organizational learning, namely management science, the organizational strategy perspective, and production management, are not easily well discernible in the learning-network perspective. The plea by Easterby-Smith (1997: 1109) to 'conceptualize organizational learning not as another managerial lever that can be pulled by senior executives at their behest, but as a normal, if problematic, process in every organization' provides a clear incentive to move away from these management-driven perspectives. In this respect the LNT offers a viable alternative approach to conceptualizing learning in organizational contexts. An accumulating body of empirical research shows that the LNT framework can be a useful tool both to understand how learning is organized in relation to work and to offer actors new possibilities for action within learning networks (e.g. Driehuis, 1997; Van der Krogt, 1998; Hoogerwerf, 1998; Poell, 1998; Poell and Chivers, 1999).

Notes

1. In most organizations these employees in the primary work process are shop-floor workers. In professional organizations (e.g. hospitals), however, the primary process is organized by professionals (e.g. doctors and nurses). The LNT was initially developed drawing primarily on studies of white-collar workers and professionals. But, in our thinking, the underlying principle of taking into account the action theories and interests of employees (besides managers and training consultants) applies to all organizations and employees.
2. In this respect, the learning-network approach is similar to situated learning theory (e.g. Lave and Wenger, 1991). It describes how learning, quite often even unconsciously, happens as part of everyday activity. Also, the LNT wants to enable a certain systematization of these informal and incidental learning activities rather than resort to their mere formalization.
3. The learning-network perspective does not address the question of individual vs organizational learning as such. Surely only individuals can learn, but the organizational context influences if they learn, what they learn, and how they learn, in the workplace, to a greater or lesser extent. The added value of the learning-network theory is that it shows how ('individual' and collective) actors themselves create ('organizational') learning arrangements in interaction with each other, which in turn influence the learning possibilities that 'the organization' can offer them.

References

Agnew, A., Forrester, P., Hassard, J. and Procter, S. (1997) 'Deskilling and Reskilling Within the Labour Process: The Case of Computer Integrated Manufacturing', *International Journal of Production Economics* 52(3): 317–24.

Andrews, P. H., and Herschel, R. T. (1996) *Organizational Communication: Empowerment in a Technological Society*. Boston: Houghton Mifflin.

Argyris, C. and Schön, D. A. (1978) *Organizational Learning: A Theory of Action Perspective*. Reading, MA: Addison-Wesley.

Arnold, R. (1994) 'Weiterbildung und Beruf' ['Continuing education and the profession'], in R. Tippelt (ed.), *Handbuch Erwachsenenbildung/Weiterbildung* [*Handbook of Adult/Continuing Education*], pp. 226–36. Opladen: Leske und Budrich.

Ayas, K. (1996) 'Professional Project Management: A Shift Towards Learning and a Knowledge Creating Structure', *International Journal of Project Management* 14(3): 131–6.

Ayas, K. (1997) 'Integrating Corporate Learning with Project Management', *International Journal of Production Economics* 51(3): 59–67.

Bazigos, M. N. and Burke, W. W. (1997) 'Theory Orientations of Organization Development (OD) Practitioners', *Group and Organization Management* 22(3): 384–408.

Benders, J. and van Hootegem, G. (1996) 'A Team Is Not a Team: Towards a Typology for Comparing Shop Floor Teams', paper presented at the WESWA conference, Utrecht, The Netherlands, November.

Biemans, H. J. A. and Simons, P. R. J. (1992) 'Learning to Use a Word Processor with Concurrent Computer-assisted Instruction', *Learning and Instruction* 2: 321–38.

Bloch, S. and Bates, T. (1995) *Employability*. London: Kogan Page.

Boonstra, J. J. and Steensma, H. O. (1996) 'Succesvol veranderen van organisaties' ['Changing Organizations Successfully'], in J. J. Boonstra, H. O. Steensma and M. I. Demenint (eds) *Ontwerpen en ontwikkelen van organisaties: Theorie en praktijk van complexe veranderingsprocessen* [*Designing and Developing Organizations: Theory and Practice of Complex Change Processes*], pp. 275–310. Utrecht: Tijdstroom.

Boot, R. and Reynolds, M. (1997) 'Groups, Groupwork and Beyond', in J. Burgoyne and M. Reynolds (eds) *Management Learning: Integrating Perspectives in Theory and Practice*, pp. 89–104. London: Sage.

Boutinet, J.-P. (ed.) (1986) 'Projet, formation-action: Première partie' ['Project and Training Action: First Part'], *Education Permanente* No. 86.

Boutinet, J.-P. and Jobert, G. (eds) (1987) 'Projet, formation-action: Deuxième partie' ['Project and Training Action: Second Part'], *Education Permanente* No. 87.

Bouwen, R. and Fry, R. (1996) 'Facilitating Group Development: Interventions for a Relational and Contextual Construction', in M. A. West (ed.) *Handbook of Work Group Psychology*, pp. 531–52. Chichester: Wiley.

Broad, M. L. and Newstrom, J. W. (1992) *Transfer of Training: Action-packed Strategies to Ensure High Pay-off from Training Investments*. San Francisco: Addison-Wesley.

Brookfield, S. D. (1986) *Understanding and Facilitating Adult Learning: A Comprehensive Analysis of Principles and Effective Practices*. Buckingham: Open University Press.

Brown, A., Evans, K., Blackman, S. and Germon, S. (1994) *Key Workers: Technical and Training Mastery in the Workplace*. Bournemouth: Hyde.

Burke, W. W. (1997) 'The New Agenda for Organization Development', *Organizational Dynamics* 26(1): 7–20.

Cheraskin, L. and Campion, M. A. (1996) 'Study Clarifies Job-rotation Benefits', *Personnel Journal* 75(11): 31–8.

Cordery, J. L. (1996) 'Autonomous Work Groups and Quality Circles', in M. A. West (ed.) *Handbook of Work Group Psychology*, pp. 225–46. Chichester: Wiley.

Davis, B. D. and Miller, T. R. (1996) 'Job Preparation for the 21st Century: A Group Project Learning Model to Teach Basic Workplace Skills', *Journal of Education for Business* 72(2): 69–73.

Day, C. and Baskett, H. K. (1982) 'Discrepancies Between Intentions and Practice: Re-examining some Basic Assumptions about Adult and Continuing Professional Education', *International Journal of Lifelong Education* 1(2): 143–55.

Dirkx, J. M. (1996) 'Human Resource Development as Adult Education: Fostering the Educative Workplace', in R. W. Rowden (ed.) *Workplace Learning: Debating Five Critical Questions of Theory and Practice*, New Directions for Adult and Continuing Education No. 72, pp. 41–7. San Francisco: Jossey-Bass.

Dixon, N. M. (1994) *The Organizational Learning Cycle: How We can Learn Collectively*. London: McGraw-Hill.

Donaldson, L. (1996) *For Positivist Organization Theory: Proving the Hard Core*. London: Sage.

Dovey, K. (1997) 'The Learning Organization and the Organization of Learning: Power, Transformation and the Search for Form in Learning Organizations', *Management Learning* 28(3): 331–49.

Driehuis, M. (1997) 'De lerende adviseur: Een onderzoek naar intercollegiaal consult in organisatieadvisering' ['The Consultant as a Learner: A Study of Peer Consultation in Organizational Consultancy'], Proefschrift TUE [PhD thesis, Technical University of Eindhoven, The Netherlands]. Delft: Eburon.

Easterby-Smith, M. (1997) 'Disciplines of Organizational Learning: Contributions and Critiques', *Human Relations* 50(9): 1085–113.

Engeström, Y., Virkkunen, J., Helle, M., Pihlaja, J. and Poikela, R. (1996) 'The Change Laboratory as a Tool for Transforming Work', *Lifelong Learning in Europe* 1(2): 10–17.

European Commission (1996) *Teaching and Learning: Towards the Learning Society*, White Paper on Education and Training. Luxembourg: Office for Official Publications of the European Communities.

Feijen, C. J. (1992) 'Nieuwe technologieën, belangenbehartiging en O.R.-educatie: Handelingsstructuren van werknemersvertegenwoordigers en educatief aanbod' ['New Technologies, Promotion of Interests, and Education of Workers' Councils: Action Structures of Workers' Representatives and Educational Supply'], Proefschrift KUN [PhD thesis, University of Nijmegen, The Netherlands]. Nijmegen: ITS.

Filipczak, B. (1995) 'You're On Your Own: Training, Employability, and the New Employment Contract', *Training* 32(1): 29–37.

Finger, M., Jansen, Th. and Wildemeersch, D. A. (1998) 'Reconciling the Irreconcilable? Adult and Continuing Education Between Personal Development, Corporate Concerns and Public Responsibility', in D. A. Wildemeersch, Th. Jansen and M. Finger (eds) *Adult Education and Social Responsibility: Reconciling the Irreconcilable*, pp. 1–26. Hamburg: Lang.

Forrester, K., Payne, J. and Ward, K. (1995) 'Lifelong Education and the Workplace: A Critical Analysis', *International Journal of Lifelong Education* 14(4): 292–305.

Fox, S. (1997) 'From Management Education and Development to the Study of Management Learning', in J. Burgoyne and M. Reynolds (eds) *Management Learning: Integrating Perspectives in Theory and Practice*, pp. 21–37. London: Sage.

Fruytier, B. (1994) 'Organisatieverandering en het probleem van de Baron van Münchhausen: Een systeemtheoretische analyse van de overgang van het Tayloristisch Produktie Concept naar het Nieuwe Produktie Concept' ['Organizational Change and the Munchausen Problem: A Systems Theoretical Analysis of the Transition From the Taylorist to the New Production Concept'], Proefschrift KUN [PhD thesis, University of Nijmegen, The Netherlands]. Delft: Eburon.

Galbraith, M. W. and Cohen, N. H. (eds) (1995) *Mentoring: New Strategies and Challenges*, New Directions for Adult and Continuing Education No. 66. San Francisco: Jossey-Bass.

Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Oxford: Blackwell.

Glaudé, M. Th. (1997) 'Werkplek-opleiden als innovatie' ['On-the-job Training as an Innovation'], Proefschrift RUU [PhD thesis, University of Utrecht, The Netherlands].

Gregory, M. (1994) 'Accrediting Work-based Learning: Action Learning—a Model for Empowerment', *Journal of Management Development* 13(4): 41–52.

Hake, B. J. (1995). 'Adult Education Research Trends in the Western European Countries',

paper presented at the conference of the European Society for Research into the Education of Adults (ESREA), Strobl, Austria, September.

Helbich, B., Stauber, E., Bockelbrink, K.-H., Lichte, R. and Reppel, R. (1993) *Kooperative arbeitsplatzorientierte Berufsbildung bei moderner Prozeßfertigung* [*Cooperative Workplace-oriented Vocational Training in Modern Process Manufacturing*]. Berlin: Bundesinstitut für Berufsbildung.

Hickox, M. (1995) 'Situating Vocationalism', *British Journal of Sociology of Education* 16(2): 153–63.

Hitchcock, D. (1994) *The Work Redesign Team Handbook: A Step-by-step Guide to Creating Self-directed Teams*. White Plains, NY: Quality Resources.

Hoff, T. J. and McCaffrey, D. P. (1996) 'Adapting, Resisting, and Negotiating: How Physicians Cope with Organizational and Economic Change', *Work and Occupations* 23(2): 165–89.

Höghielm, R. and Gougoulakis, P. (1995) 'The Pedagogical Process in Swedish Study Circles', paper presented at the conference of the European Society for Research into the Education of Adults (ESREA), Strobl, Austria, September.

Hoogerwerf, E. C. (1998) 'Opnieuw leren organizeren: Sociotechniek in actietheoretisch perspectief' ['Organizing Learning Anew: Sociotechnical Design from a Theory of Action Perspective'], Proefschrift KUN [PhD thesis, University of Nijmegen, The Netherlands]. Utrecht: Lemma.

Jacobs, R. L. and Jones, M. J. (1995) *Structured On-the-job Training: Unleashing Employee Expertise in the Workplace*. San Francisco: Berrett-Koehler.

Judson, A. S. (1991) *Changing Behavior in Organizations: Minimizing Resistance to Change*. Cambridge, MA: Blackwell.

Knowles, M. (1978) *The Adult Learner: A Neglected Species.*, 2nd edn. Houston: Gulf.

Kraayvanger, G. and van Onna, B. (eds) (1985) *Arbeid en leren: Bijdragen tot de volwasseneneducatie* [Work and Learning: Contributions to Adult Education]. Baarn: Nelissen.

Kraayvanger, G. and Van der Krogt, F. J. (eds) (1995) *Work and Learning: Opportunities and Risks*. Nijmegen: ITS.

Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*. New York: Cambridge University Press.

Levine, J. M., Resnick, L. B. and Higgins, E. T. (1993) 'Social Foundations of Cognition', *Annual Review of Psychology* 44: 585–612.

Locke, E. A. and Latham, G. P. (1990) *A Theory of Goal Setting and Task Performance*. Englewood Cliffs, NJ: Prentice Hall.

McAdam, J. (1995) 'Joint Action Learning: A Collective Collaborative Paradigm for the Management of Change in Unionized Organizations', *Journal of Managerial Psychology* 10(6): 31–40.

McGivney, V. (1992) *Motivating Unemployed Adults to Undertake Education and Training: Some British and Other European Findings*. Leicester: NIACE.

McLagan, P. A. (1989) *Models for HRD Practice*. Alexandria, VA: ASTD.

Mai, M. (1993) *Inhalte und Forme der Weiterbildung unter der Bedingungen des industriellen Strukturwandels: Zur Planbarkeit von Qualifikationen am Beispiel der Ingenieure* [Content and Form of Continuing Education under the Conditions of Structural Change in Industry: The Possibilities for Planning Qualifications by the Example of Engineers]. München, Profil.

Manninen, J. (1996) 'Training for Jobs or Learning for Change? Labour Market Strategies in a Late Modern Society', paper presented at the conference of the European Society for Regional and International Social Research (EGRIS), Dresden, Germany, November.

Marsh, C. J. and Willis, G. (1995) *Curriculum: Alternative Approaches, Ongoing Issues*. Englewood Cliffs, NJ: Prentice Hall.

Mintzberg, H. (1979) *The Structuring of Organizations*. Englewood Cliffs, NJ: Prentice Hall.

MOCW (1998) *Nationaal actieprogramma 'een leven lang leren'* [National Action Programme 'Lifelong Learning']. Zoetermeer: Ministerie van Onderwijs, Cultuur en Wetenschappen.

Mohrman, S. A., Cohen, S. G. and Mohrman, A. M., Jr (1995) *Designing Team-based Organizations: New Forms of Knowledge Work*. San Francisco: Jossey-Bass.

Mumford, A. (ed.) (1997) *Action Learning at Work*. Aldershot: Gower.

Murphy, G. (1996) 'Employment and Training: Making the Connection', *Adult Learning* 7(5): 22–31.

Nonaka, I. and Takeuchi, H. (1995) *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford: Oxford University Press.

Onstenk, J. H. A. M. (1997) 'Lerend leren werken: Brede vakbekwaamheid en de integratie van leren, werken en innoveren' ['Learning to Work by Learning: Broad Professional Skills and the Integration of Learning, Work, and innovation']. Proefschrift KUN [PhD thesis, University of Nijmegen, The Netherlands]. Delft: Eburon.

Oshima, J., Scardamalia, M. and Bereiter, C. (1996) 'Collaborative Learning Processes Associated with High and Low Conceptual Progress', *Instructional Science* 24(2): 125–56.

Otte, R. and Schlegel, W. (1992) *Continuing Education and Training of the Long-term Unemployed in Ten Member States of the European Community; Summary Report*. Berlin: CEDEFOP.

Poell, R. F. (1998) *Organizing Work-related Learning Projects: A Network Approach*. Nijmegen: University of Nijmegen.

Poell, R. F. and Chivers, G. E. (1999) 'The Changing Role of Training Consultants in Organizing Work-related Learning', in K. P. Kuchinke (ed.) *Proceedings of the Annual Conference of the Academy of Human Resource Development in Washington, USA*, pp. 1061–7. Urbana-Champaign: University of Illinois.

Poell, R. F. and Tijmensen, E. C. M. (1998) 'Using Learning Projects to Work Towards a Learning Organisation: Two Cases from Professional Work', in R. F. Poell and G. E. Chivers (eds) *Continuing Professional Development in Europe: Theoretical Views, Fields of Application, and National Policies*, pp. 39–53. Sheffield: University of Sheffield.

Poell, R. F., Tijmensen, E. C. M. and Van der Krogt, F. J. (1997) 'Can Learning Projects Help to Develop a Learning Organization?', *Lifelong Learning in Europe* 2(2): 67–75.

Poell, R. F., Van der Krogt, F. J. and Warmerdam, J. W. M. (1998) 'Project-based Learning in Professional Organizations', *Adult Education Quarterly* 49(1): 28–42.

Poell, R. F., Van der Krogt, F. J. and Wildemeersch, D. A. (1998) 'Solving Work-related Problems through Learning Projects', *International Journal of Lifelong Education* 17(5): 341–51.

Poell, R. F., Van der Krogt, F. J. and Wildemeersch, D. A. (1999) 'Strategies in Organizing Work-related Learning', *Human Resource Development Quarterly* 10(2): 43–61.

Raelin, J. A. (1994) 'Whither Management Education? Professional Education, Action Learning and Beyond', *Management Learning* 25(2): 301–17.

Raelin, J. A. (1997) 'Action Learning and Action Science: Are They Different?', *Organizational Dynamics* 26(1): 21–34.

Revans, R. W. (1980) *Action Learning: New Techniques for Management*. London: Blond and Briggs.

Rhodes, C. (1997) 'The Legitimation of Learning in Organizational Change', *Journal of Organizational Change Management* 10(1): 10–20.

Riemer, F. J. (1997) 'From Welfare to Working Poor: Prioritizing Practice in Research on Employment-training Programmes for the Poor', *Anthropology and Education Quarterly* 28(1): 85–110.

Riesewijk, B. and Warmerdam, J. H. M. (1988) *Het slagen en falen van automatiseringsprojecten: Een onderzoek naar de sociaal-organisatorische implicaties van automatisering voor gebruikersorganisaties en computer service bedrijven* [Success and Failure in Automation Projects: A Study of the Social-organizational Implications of Automation for User Organizations and Computer Service Companies]. Nijmegen: ITS.

Roth, G. L. and Niemi, J. (1996) 'Information Technology Systems and the Learning Organization', *International Journal of Lifelong Education* 15(3): 202–15.

Schneider, J. and Stötzel, B. (1993) *Lernen in der Lernstatt* [Learning in the Learning Place], Materialen zur beruflichen Bildung No. 93. Berlin: Bundesinstitut für Berufsbildung.

Senge, P. M. (1990) *The Fifth Discipline: The Art and Practice of the Learning Organization.* London: Century Business.

Simons, P. R. J. (1990) 'Transfervermogen' ['Transfer ability'], Inaugurele rede KUN [Inaugural lecture, University of Nijmegen, The Netherlands].

Simons, P. R. J. and Zuylen, J. G. G. (eds) (1995) *De didactiek van leren leren* [The Didactics of Learning to Learn]. Tilburg: MesoConsult.

Smith, R. M. (1990) *Learning to Learn Across the Life Span.* San Francisco: Jossey-Bass.

Swanson, R. A. and Arnold, D. E. (1996) 'The Purpose of Human Resource Development is to Improve Organizational Performance', in R. W. Rowden (ed.) *Workplace Learning: Debating Five Critical Questions of Theory and Practice*, New Directions for Adult and Continuing Education No. 72, pp. 13–20. San Francisco: Jossey-Bass.

Tsang, E. W. K. (1997) 'Organizational Learning and the Learning Organization: A Dichotomy Between Descriptive and Prescriptive Research', *Human Relations* 50(1): 73–89.

Van der Krogt, F. J. (1995) *Leren in netwerken: Veelzijdig organiseren van leernetwerken met het oog op humaniteit en arbeidsrelevantie* [Learning in Networks: The Many-faceted Job of Organizing Learning Networks with a View to Humanity and Work Relevance]. Utrecht: Lemma.

Van der Krogt, F. J. (1998) 'Learning Network Theory: The Tension Between Learning Systems and Work Systems in Organizations', *Human Resource Development Quarterly* 9(2): 157–77.

van der Sanden, J. M. M. (1997) 'Duurzame ontwikkeling van leervermogen: Leren leren in het technische domein' ['Lasting Development of Learning Skills: Learning to Learn in the Technical Domain'], Intreerede TUE [Inaugural lecture, Technical University of Eindhoven, The Netherlands].

van Ginkel, K., Mulder, M. and Nijhof, W. J. (1994) *HRD-Profielen in Nederland.* Enschede: Universiteit Twente.

van Zolingen, S. J. (1995) 'Gevraagd: sleutelkwalificaties: Een studie naar sleutelkwalificaties voor het middelbaar beroepsonderwijs' ['Demanded: Key Qualifications: A Study of Key Qualifications for Secondary Vocational Education'], Proefschrift KUN [PhD thesis, University of Nijmegen, The Netherlands].

Vennix, J. A. M. (1996) *Group Model Building: Facilitating Team Learning Using System Dynamics.* Chichester: Wiley.

Verdonck, G. (1993) 'Leergerichte werkposten: Case-studies in Vlaamse metaalbedrijven' ['Learning-oriented Workplaces: Case Studies in Flemish Metal Industries'], *Opleiding & Ontwikkeling* 6(9): 21–8.

Watkins, K. E. and V. J. Marsick (1993) *Sculpting the Learning Organization: Lessons in the Art and Science of Systemic Change.* San Francisco: Jossey-Bass.

Wijnhoven, A. B. J. M. (1995) 'Organizational Learning and Information Systems: The Case of Monitoring Information and Control Systems in Machine Bureaucratic Organizations', Proefschrift UT [PhD thesis, Twente University, The Netherlands]. Enschede: Twente University.

Wildemeersch, D. A. (1995) 'Een verantwoorde uitweg leren: Over sociaal verantwoord handelen in de risicomaatschappij' ['Learning to Find the Responsible Way Out: On Socially Responsible Action in the Risk Society'], Inaugurale rede KUN [Inaugural lecture, University of Nijmegen, The Netherlands].

Wilson, A. L. and Cervero, R. M. (1997) 'The Song Remains the Same: The Selective Tradition of Technical Rationality in Adult Education Programme Planning Theory', *International Journal of Lifelong Education* 16(2): 84–108.

Contact Addresses

Rob F. Poell is in the Department of Education, University of Nijmegen, PO Box 9104, 6500 HE Nijmegen, The Netherlands. [email: R.Poell@ped.kun.nl]

Geoff E. Chivers is in the Division of Adult Continuing Education, University of Sheffield, UK.

Ferd. J. Van der Krogt is in the Department of Education, University of Nijmegen, The Netherlands.

Danny A. Wildemeersch is in the same department of the University of Nijmegen, address as above.