



# Bureaucratic boundaries for collective learning in industrial work

Mari Kira and Ekkehart Frieling

*Institute of Industrial Science, University of Kassel, Kassel, Germany*

## Abstract

**Purpose** – The purpose of the paper is to explore individual and collective workplace learning and the connections between them in the contemporary industrial work.

**Design/methodology/approach** – Two case studies were carried out in the Finnish package-supplier sector. The research methods applied were standardized observations and qualitative interviews.

**Findings** – The cases show that the socio-technical influences have created learning-conductive work at the individual level, but failed to create optimal possibilities for collective learning. The still-prevailing bureaucratic power relations prevent employees from fully contributing to collective learning and organizational development.

**Research limitations/implications** – Workplace-learning research should study more rigorously the connections between individual and collective learning and, especially, the ways in which the prevailing power relations influence them. Integrating concepts from chaotic systems thinking to the workplace-learning theory seems fruitful and could be pursued further.

**Practical implications** – In order to become organizations in which internal and external development may take place at the individual and collective levels alike, the case companies should directly address their shared mental models regulating employees' participation opportunities rather than leave those models to develop in a non-reflected way.

**Originality/value** – The paper contributes to the field of workplace learning by presenting a conceptual model on sustainable development building on concurrent individual and collective learning. With the help of this model, founded on several theoretical traditions, strengths and weakness in an organization's approach to workplace learning can be detected.

**Keywords** Workplace learning, Team learning, Bureaucracy, Sustainable development

**Paper type** Research paper

## Introduction

In the Nordic countries, socio-technical systems thinking (STST) has been an important work-organizational paradigm influencing the design and organization of work (for a review on STST, see Van Eijnatten, 1993). On the one hand, STST has informed the training of working-life developers (e.g. Vartiainen, 1994) and, on the other hand, nationwide workplace development programs have had obvious socio-technical flavors (see, for example, Svensson *et al.*, 2002; Alasoini *et al.*, 2005). The goal of STST is to promote employees' well-being and development simultaneously with a company's competitiveness (e.g. Forslin, 1990). In practice, developmental and learning-conductive work has been created through job



---

enlargement, job enrichment, and increased autonomy (e.g. Thorsrud and Emery, 1969); group work has been the traditional socio-technical work-organizational form (Vartiainen *et al.*, 1999). But what kinds of workplaces have the socio-technical influences created in the Nordic countries? To what degree is the contemporary industrial work there learning conducive? The aim of this paper is to discuss individual and collective learning in Finnish industrial work. The central research questions are:

- How does individual learning take place in the contemporary industrial work?
- How does individual learning transcend to collective or joint learning of an organization's members?

With the help of two case studies in the Finnish package-supplier sector, the opportunities of employees to learn individually and as a collective are assessed. Possibilities for further workplace learning are outlined as well.

A key proposition in the paper is that the socio-technical influences should have paved the way for individual-level workplace learning in Finnish industry. The research focuses on a traditional manufacturing sector to gain insight into whether the socio-technical ideas of developmental work have prevailed in Finland, or whether alternative work-organizational paradigms – such as Taylorism (Taylor, 1998) or lean production (Womack *et al.*, 1990) with their focus on specialization and confined job contents – are more influential there. Moreover, if the socio-technical approach has prevailed, are the socio-technical learning opportunities enough to respond to the learning requirements present in contemporary industrial work? The aim is also to study whether employees are able to learn together. Is it possible for employees, for instance, to collectively develop new production-related knowledge and working methods? As noted above, STST has promoted the creation of work groups, and that would imply the possibility for such joint or collective learning as well. However, are work groups enough? Does collective learning take place also in a wider manner, going beyond the group boundaries? As the main result of these investigations, we find that socio-technical influences have indeed created learning-conducive work at the individual level, but failed to create optimal possibilities for collective learning. The still-prevailing bureaucratic power relations prevent employees from fully contributing to collective learning and organizational development.

The paper is structured as follows. We first define a theoretical framework of individual and collective learning in order to be explicit about how we understand workplace learning. The framework addresses the work and organizational prerequisites for learning, workplace learning processes, and the outcomes of learning. Several workplace-learning theory traditions and an emerging systems-thinking approach are used as ingredients. We then explain the research methodology and the sample of the study. After this, we present the case study findings separately for individual and collective learning. We conclude the paper by discussing the positive possibilities for individual learning in contemporary industrial work apparent in the case studies and the lack of collective learning detected in them.

### **Workplace learning for greater complexity in awareness and actions**

In our framework of workplace learning, we approach individual learning as an individual-in-community process (Fenwick and Rubenson, 2005): employees learn

---

through their experiences in work communities. This approach is also inherent to STST, with its aim of designing workplaces that support individual learning and development (e.g. Thorsrud and Emery, 1969). Furthermore, individual and collective learning are addressed in our model to take place at separate, yet interacting aggregation levels. Individual learning outcomes – when shared – provide a starting point for collective learning processes (Crossan *et al.*, 1999) during which employees together create new knowledge and work methods that, eventually, can be applied everywhere in the organization. Collective learning outcomes thus create shared practices that may either support or delimit further individual learning. Finally, concepts from chaotic systems thinking (see below) are incorporated to the framework in order to capture the “internal” and “external” domains of workplace learning and to overcome the strict division between the individual and collective workplace-learning levels.

#### *Individual workplace learning*

For workplace learning to take place at the individual level, the culture of the workplace must support it (e.g. Evans and Kersh, 2004). Moreover, work design and organizational practices must provide opportunities for learning. Learning-conductive work has been described as being variable, complex, and autonomous. It also gives opportunities for participation, collaboration, information exchange and feedback. (e.g. Barnett, 1999; Skule, 2004). In a nutshell, learning-conductive work invites employees to participate in various workplace events and work activities (Billett, 2001), providing new experiences and thus fuel for learning. As stated above, in the socio-technical tradition, such work has been sought through job enlargement and enrichment, and by granting a higher degree of autonomy to groups formed by production employees (e.g. Dankbaar, 1997).

As an outcome of the individual-level workplace learning, employees’ cognitive, affective, transpersonal, and psychomotoric domains transform (e.g. Barnett, 1999; Karakowsky and McBey, 1999; Illeris, 2004a). This is because a new work experience places a demand for a change in an individual’s understanding of and acting in the world (Barnett, 1999). At its best, workplace learning supports the development of both the internal and external domains of an individual. When it comes to the internal domain, one can hypothesize several areas of development relating to the awareness of work, work organization, and oneself. Learning-conductive work, for instance, may enable employees to create an understanding on the object of their work and the tasks required at work (e.g. Sandberg, 2000). The awareness of the unique structural and procedural characteristics in the work organization may also develop through workplace learning (e.g. Billett, 1995; Paloniemi, 2006). Workplace learning can also shape employees’ identities (Illeris, 2004b) and support them in gaining a more complex awareness of themselves (Paloniemi, 2006; Wilhelmson, 2006). When it comes to the external domains, workplace learning may promote various skills and competencies making alternative work actions possible (e.g. Illeris, 2004a; Paloniemi, 2006).

Consequently, various areas of individuals may develop through workplace learning and, furthermore, the integration of these areas may grow. For instance, the awareness of oneself and of the work organization intertwine into situated job competence (cf. Illeris, 2004b), or into an ability to function in one’s job role. A deeper

---

understanding of work may lead to more expedient physical work movements. One can therefore say that the internal and external complexity of an individual grows through workplace learning. Complexity can be defined as the increasing distinctiveness of various resources and their simultaneous integration to each other (e.g. Heylighen, 1996; Csikszentmihlayi, 1990). Through workplace learning, various “internal” (awareness-related) and “external” (action-related) resources become more unique, but also better integrated to each other; the potential for alternative internal and external actions increases (e.g. Schoenfeld, 1999).

### *Collective workplace learning*

A collective learning process starts when individuals share the outcomes of their learning processes, their intuitions, with others (Crossan *et al.*, 1999). Individuals’ intuitions are subsequently elaborated through joint reflecting and doing in a group (Nonaka, 1994). The outcomes from such collective knowledge creation are eventually integrated to the existing group-level mental models and action patterns. When applied regularly, the new models and patterns may become institutionalized and form the articulated and unarticulated practices, processes, and structures of the organization, its values and norms (Crossan *et al.*, 1999). The collective workplace learning of an organization’s members therefore manifests itself as changes in the institutionalized structures, processes, practices, and mental models.

Just like individual employees, a collective may also grow in terms of external and internal complexity as the result of workplace learning. The organizational practices and structures (“the externals”) may become more unique but also better integrated to each other. As a result, organizational structures and practices “fit” better together and, potentially, more effective organizational actions are possible (e.g. Miles and Snow, 1990). Shared mental models or collective awareness may develop in its complexity as well. At the collective level, the greater complexity of awareness means a more diverse set of shared goals and priorities. For instance, business, social, and ecological outcomes are equally emphasized in an internally complex organization (cf. Pfeffer, 1998; Fischer, 2003; Kira, 2003).

The complexity of collective awareness also shows in the nature of organizational power relations, which can be characterized in terms of two opposing power paradigms:

- (1) the simple authoritarian power of bureaucracy; or
- (2) the more complex power bases of post-bureaucracy (e.g. Heckscher and Donnellon, 1994).

When bureaucratic power relations prevail, the power to influence the organization is in the hands of a few managers (see, for example, Gerth and Mills, 1985). Employees’ opportunities, especially for collective learning, remain limited as employees are supposed to focus on their confined work areas rather than to get involved in broader decision-making within the organization (see Heckscher, 1994). Post-bureaucracy, in its turn, stands for more complex power relations, allowing all organization members to participate and exercise influence (see, for example, Heckscher, 1994; Kira, 2003). STST has been envisioned to offer practical possibilities to depart from the bureaucratic approach by increasing the participation opportunities of employees (Emery, 1995). In post-bureaucratic organizations (and thus in organizations influenced by STST),

---

workplace learning should become more probable as employees may participate in different workplace events and have influence on them (Howard, 1995).

Organizational power relations naturally depend on, for example, the prevailing societal power relations, but can also be understood as outcomes of collective learning processes within an organization (cf. Barley and Tolbert, 1997). Power relations are continuously shaped and learned in collaboration and participation situations, either including employees in or excluding them from the organizational decision-making. In this sense, collective workplace learning shapes power relations and eventually influences the action scope of employees and their possibilities for further workplace learning.

*Individual and collective workplace learning: a holonic, sustainable process*

Individual and collective workplace learning processes are thus characterized by two factors:

- (1) simultaneous external and internal learning; and
- (2) the two-way influence relations between individual and collective learning.

These two factors are also emphasized in the recent developments in systems thinking within organization theory (e.g. Fitzgerald and Van Eijnatten, 1998). Especially, the emerging field of chaordic systems thinking (CST; see Van Eijnatten, 2004) studies not only the visible “external” aspects of an organization, but also pays equal attention to the invisible “internal” aspects, such as individual and shared mental models. CST also investigates organizations as “holonic” structures, where each member of an organization is understood – at the very same time – as an independent whole and as a part that both depends on and influences the organization – the whole-part being or the “holon” (e.g. Wilber, 1996).

Therefore, CST offers conceptual tools for the assessment and development of a work organization going beyond the traditional STST approaches (Van Eijnatten and Hoogerwerf, 2000). Practical applications of STST can be criticized for mainly paying attention to the external aspects and less attention to the internal aspects of a work organization. STST interventions have also focused on how changes in, for example, division of labor influence employees and they have paid less attention to how employees shape their work organization (Kira and Van Eijnatten, 2006). The workplace learning framework presented above obviously adheres to chaordic systems thinking. We are thus proposing a framework that is potentially able to illuminate workplace-learning events that might remain hidden if studied only from the socio-technical perspective.

The holonic nature, or the dualistic whole and part nature, of workplace learning (Wilber, 1996; Van Eijnatten, 2004) becomes evident with the framework discussed above. To start with, various “parts” of an individual (cognition, emotions, and physical skills) transform through learning independently, but the individual also learns and transforms as a whole, integrated being (Illeris, 2004b). The “parts” of an organization (its employees) learn, but learning also takes place at the collective level, leading to new shared awareness and action possibilities (Crossan *et al.*, 1999). Collective learning within an organization is furthermore only possible when employees share their thoughts and engage in joint reflection and working with their colleagues. Collective learning thus requires employees to exercise their capacity to

change their work organization or, in other words, to exercise their holonic capacity (Fitzgerald and Van Eijnatten, 1998; Van Eijnatten, 2004). Holonic capacity means individuals' ability to operate with a greater mindfulness and expanded awareness: to comprehend their work situation. Holonic capacity also demonstrates itself in the willingness to learn and develop (Fitzgerald and Van Eijnatten, 1998). Individuals can thus be understood as holons who, when sharing their insights and intuitions, exercise their holonic capacity to change themselves and also their environment. The possibility of employees exercising their holonic capacity depends directly on the organizational power relations. When bureaucratic power relations prevail, the possibilities of exercising holonic capacity are rather low at the employee level (see above). In a post-bureaucratic organization, the power to transform the organization instead originates from many sources, and employees have more possibilities to exercise their holonic capacity.

At its best, workplace learning may thus mean the development of complexity in awareness and actions at both the individual and collective levels, with employees being able to contribute to the collective development by exercising their holonic capacity. The areas of complexity development through workplace learning are summarized in Table I. The columns of Table I indicate the "internal" and "external" domains while the rows distinguish between the individual and collective levels. Through workplace learning, the awareness of an individual and collective may develop. Where an individual gains, for example, more multi-faceted self-image and work-system image, shared mental models and power relations may develop more complexly at the collective level. In the external domain, individuals become capable of using different skills and competencies while an organization is able to establish various integrated structures and practices.

Sustainable working-life development can be defined to stem from the simultaneous growth in internal domains (complexity of awareness) and external domains (complexity of actions) both in employees and organizations they form. Such development is sustainable because it enables both employees and organizations to keep up their functioning capability in the changing world. Instead, unsustainable development is partial development where, for example, a work organization reaches its business objectives by exploiting its employees or the external actions develop without the corresponding growth in the awareness (see, for example, Kira and Van Eijnatten, 2006). An organization cannot achieve its business outcomes in a sustainable manner by exploiting its employees' resources. Similarly, sophisticated organizational practices will not function as planned if the organization's members do not comprehend them individually and collectively. All the areas of complexity distinguished in Table I need thus to develop simultaneously to secure employees' and organizations' capability to function in a sustainable manner. In this paper, the aim

**Table I.**  
The areas of internal and external complexity development in individuals and collectives (see also Wilber, 1996; Van Eijnatten, 2004)

	Internal – complexity of awareness	External – complexity of actions
Individual	Self-image System image	Demonstration of skills Competence
Collective	Mental models Power relations	Structures Practices



---

is consequently to explore the possibilities for sustainable working-life development through individual and collective learning.

### Methods and sample

---

The research reported here presents the first phase of an international comparative study on workplace learning (Kira, 2007). The empirical data was collected in two Finnish case companies operating in the package-supplier sector. One case company produces paper-based packages and other flexible packages (of paper, plastic, and metal), mainly for the food industry. Forty-five employees working in five plants of the two case companies were interviewed, and their work was observed (interview-observations lasted from 1.5 to four hours). These informants work as machine operators on material manufacturing, die-cutting, extrusion-laminating, flexoprinting, rotogravure printing, and offset printing machines. On each machine type studied in a company, three to four machine operators were interviewed and observed, and the resulting data was analyzed as one group in order to gain a comprehensive picture of the learning opportunities on the machine type in question. Each informant was first interviewed away from the production machine. A semi-structured interview guide with open questions (see Emans, 2004) covering the interviewees' experiences of workplace learning was developed for these qualitative interviews. Areas covered included the variability, complexity, and independence of work, the collaboration and participation opportunities available, as well as feedback and information received by the employees relating to their work ("learning conditions"). According to the study's theoretical framework, these characteristics of work and organization support individual-level learning (see above). The work of each interviewee was also observed. In the observations, a standardized observation guide (Frieling *et al.*, 2006) was used for assessing the same learning conditions as in the qualitative interviews. Handwritten notes were taken during the interviews and observations, and the standardized observation schedule was filled in. Also, 11 representatives of the general and production management were interviewed in the two companies about their views on workplace learning. The management interviews were analyzed as one group for each company.

The observation data was analyzed quantitatively: mean values for different learning conditions were calculated at the company level in order to gain a rough estimate of the learning opportunities present[1]. The interview data was analyzed qualitatively. All interview notes for a group of machine operators working on similar machines in a case company, or for a group of managers, were first categorized based on the emerging major themes relating to the research questions. In the next step, emerging sub-themes were recognized within the major themes. In the following step, the "red threads" traveling across the themes and sub-themes were recognized. In the last phase, the most important common phenomena for all different machine types studied in a case company were recognized. Comprehensive reports containing all the analysis outcomes were submitted to the case companies. Feedback sessions on research were arranged for managers and employees in both companies. The validity of research was thus secured through the triangulation of various data sources (employee and management interviews as well as observations) and through reviewing the research outcomes with the informants (cf. Cresswell and Miller, 2000).

---

### **Individual and shift-group learning at the workplace: reaping the benefits from the socio-technical era**

In both companies studied, employees working on a production machine in the same shift form a shift group. Each shift group is responsible for carrying out customer orders according to the production schedule (e.g. manufacturing, printing, or die-cutting packaging material based on a customer's order). The shift groups plan the way they carry out the orders, set up their machines via computers and also manually, carry out the production runs, and supervise the product quality. In the paper-based package-supplier company, the employees are responsible for quality. They decide when to move from set-up to the production run and have the responsibility for responding to customer complaints. In the flexible package-supplier company, first-line management personally supervises the transition from set-up to production and responds to complaints. Therefore, responsibilities are divided differently in the two companies when it comes to the quality issues. Nevertheless, the employees of both companies express that they feel responsible for and oversee the product quality. Indeed, the shift groups are responsible for diagnosing any quality or technical problems that appear. In some cases, they fix the problem themselves and, when a more complicated problem emerges, they decide whose help they ask for (e.g. first-line managers or maintenance employees). All in all, the communication flows freely in the companies – rather than routing information via the management hierarchy, employees are encouraged to contact others within their plant. In the paper-based package-supplier company, a production manager talked about “natural collaboration” between all the employees and managers as the goal.

The aim has also been to broaden the task mastery of the employees, such that they master all the tasks on their machines. According to the manager interviewees, the need for flexible customer responsiveness has been the engine of this development. The need to create meaningful work content and to secure the retention of qualified employees has also been a factor. “Multiskilling” has, however, changed the whole task dynamics. The traditional role division between a machine operator (a shift-group leader) and assistants (with more limited areas of responsibility) is vanishing. The work area of many employees has extended from mastering a certain role to mastering many or all of the tasks on a production machine. From the point of view of the machine operators, this means that sometimes they too carry out more simple tasks. Many machine operators interviewed do not mind this, as the more simple tasks give them a break from the more complicated tasks, and doing more simple tasks helps them to keep up their comprehensive mastery of the machine.

Shift-group-level autonomy and “multiskilling” obviously increase the employees' participation opportunities, and thus learning opportunities. However, there are also factors that delimit individual and shift-group-level learning. Above all, production technology applied in both companies is mature (as it seems to be in the package-supplier sector in general): production machines may be several decades old. Work routines have become established, and the employees often find it difficult to see alternatives for the traditional ways of working. Nevertheless, new products with new printing patterns and product shapes turn up, and the interviewees tell how customer demands are getting tougher. Learning situations originating from production changes thus emerge from time to time.



---

The work and organizational design in both case companies is, therefore, obviously following the socio-technical tradition. Job enlargement has taken place through “multiskilling”. Job enrichment expands the task scope of the employees. Indeed, work progresses from planning to carrying out the tasks and evaluating the outcomes. In addition to such cyclical wholeness, work is also hierarchically whole (see, for example, Vartiainen, 1994). It demands the use of skills at different levels, for example cognitive skills when setting up a machine via computers and manual skills when doing the set-up by hand. The extensive group-level autonomy furthermore grants many possibilities to influence one’s work. As an employee put it: “Decisions can be made at work”. According to STST, work of this nature supports employees’ learning and development. Individual and shift-group level learning does indeed take place in the case companies. The shift groups, for instance, develop and implement new working methods and practices. The interviewees note that details of work are done differently in various shift groups working on the same machine.

### **Accidental collective learning**

Work supports also collective learning (i.e. learning together) to some extent. While working, the employees of a shift group are able to exchange ideas, elaborate them, and create new working methods or make technical improvements. There are, however, factors that delimit collective learning. For instance, daily work is often hectic. Customer orders are short and the cycle of planning, setting up, and carrying out an order turns around rapidly. The exchange of ideas and learning together within a shift-group is therefore limited by the sheer speed of the daily work.

Moreover, only employees working on the same shift communicate with each other and have a chance to learn together. There are few forums for employees working on the same machine, but on different shifts, to engage in collective learning. In the paper-based package-supplier company, there is an aim to arrange regular meetings for employees working on a certain production machine. Due to vacations and production pressures, these meetings are nevertheless arranged quite irregularly. Even when meetings are arranged, they often fail to provide venues for employee-driven and work-focused discussions. Instead, the meetings are management-driven, containing top-down information on the overall situation of the company, the interviewees report. In the flexible package-supplier company, regular meetings for employees working on the same machine are not arranged. Irregularly arranged meetings are focusing only on issues chosen for discussion by the management. Meetings for all shifts of a machine focusing on work experiences and small innovations made in the various shift groups might, nevertheless, support questioning the traditions and finding new ways to carry out work tasks.

Collective learning is also limited in its scope to issues relating mainly to daily work activities. The shift groups have much fewer opportunities to influence the “framework conditions” of the production processes (e.g. the production planning or the characteristics and shape of the machine). Some such opportunities do emerge in the interviews. For instance, to reduce the set-up times, the employees may suggest changes to the production schedule (originally done in the production planning department) and thus influence the sequence in which the customer orders are carried out. In the paper-based package-supplier company, some employees have also participated in the acquisition of new machine parts. They have met with several

---

suppliers and purchases have been made based on their recommendation. In the flexible package-supplier company, the employees are actively making technical improvements to their machines. However, as a counter-weight to the positive examples above, the interviewees also describe situations where they have not been able to influence the production plan and where reasonable development initiatives have not been heeded by management. In these situations, the employees have not been able to influence the way the production processes are carried out or their further development. This can be understood as a breakdown in the collective learning cycle – the intuition of an employee has not been allowed to become a seed for collective learning. Such situations have created dissatisfaction among the employees. They feel that their expertise has not been appreciated and, due to the unresponsiveness of management, suboptimal work practices and processes have been maintained.

In both case companies, even though the employees have gained high autonomy in their daily work, organizational practices have not developed to correspond to this situation. There are no venues for the employees to share their intuitions and to elaborate them together into new shared practices and knowledge. Furthermore, the development initiatives of the employees are not always listened to, and opportunities for individual learning to feed collective learning are missed.

### **Discussion: exercising holonic capacity for collective learning**

Industrial work, as designed in the case companies, offers possibilities for individual development and learning. The employees have as rich and varied jobs as the mature production technology enables them to have, and there are few organizational boundaries that prevent the employees from experiencing and experimenting with new things in their daily work. The complexity of actions – skills and competence – is nurtured in this type of work. Indeed, the interviewees indicate how the employees devise new ways of working and adapt their work approaches to changing production situations. This type of work also supports the development of the internal complexity of individuals, as they get a chance to create a more complex understanding of the object of their work. The “natural collaboration” – i.e. the employees’ right to contact others freely in the plant – supports the development of internal complexity as well, since employees get a chance to learn about the production processes as whole and also perceive their role in that whole (cf. Mezirow, 1997).

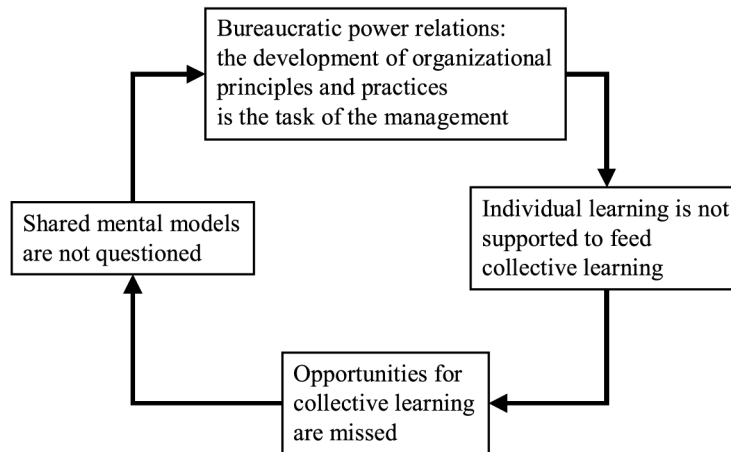
Socio-technical influences, rather than the other alternative work-organizational paradigms (Taylorism or lean production), thus characterize the industrial work settings studied. Through job enlargement and enrichment as well as through increased autonomy, employees have gained learning opportunities. However, such individual-level learning could be supported even further by providing space for reflection. Through reflection, the experience-based learning outcomes could be conceptualized into more abstract and overarching work principles (Kolb, 1984). Work-focused, reflective dialogues between managers and employees would help in questioning and extending the current individual and shared frames of reference on work (Mezirow, 1997). Therefore, assessing workplace-learning opportunities through the CST lens (rather than only the STST lens) also reveals boundaries for individual learning in regard to “internal” aspects.

Collective learning is not optimally supported in the case companies. The employees have opportunities to learn within the work organization, but they have fewer

opportunities to “make” the work organization learn. Collective learning, reaching both the internal and external aspects of the work organization, is hindered by discontinuities between individual and collective learning. Venues for sharing individuals’ insights and jointly interpreting them simply are not available. Also, the occasional lack of response from the management prevents the employees’ development initiatives from becoming a part of the shared knowledge base. In the case companies, the possibility of the employees of exercising their holonic capacity and contributing to organizational development is obviously limited.

One factor contributing to the disrupted collective learning processes may be the bureaucratic power relations that still prevail. Autonomy in employees’ daily work has extended, because that makes sense from the point of view of business as well. Autonomous and “multiskilled” employees can act quickly and flexibly in the face of rapidly changing production requirements. However, giving employees a chance to engage in collective learning would mean that they would gain opportunities to influence not only their immediate daily work activities, but also the framework conditions of production processes or, in other words, the principles and practices according to which work is carried out. Such change has not emerged as a by-product of socio-technical job design propelled by competitive pressures, but would require a new approach to power relations from both management and employees. It would require adopting post-bureaucratic power relations, also enabling employees to get involved with overall work-organizational development.

Socio-technical influences have thus not truly changed the internal aspects of the organizations studied, even though the aim of STST is to offer an alternative to bureaucracy (Emery, 1995). In the case companies, the principles of autonomy and participation are still constrained by bureaucratic power relations. One can see a vicious circle of factors contributing to the lack of collective learning, as illustrated in Figure 1 (the arrows in Figure 1 indicate causality). In the first place, bureaucratic power relations retain the overall work-system development as a managerial prerogative. Such an attitude hinders individual employees from sharing their work-process related ideas and insights with others, and thus prevents employees from feeding collective learning processes. As collective learning is hampered, the internal



**Figure 1.**  
The vicious circle of  
missed opportunities for  
collective learning

---

aspects of the organizations (e.g. shared mental models on power relations) remain unquestioned and unchanged. Therefore, movement away from bureaucratic power relations does not happen either. And, due to such bureaucratic relations, individual employees are not able to contribute to collective learning. It seems that as socio-technical influences have failed to draw attention to the *internal* individual and collective development, they also have failed to offer a true departure from bureaucracy. To summarize, in the case companies, there seems to exist only a vision of individual learning as a path towards the satisfaction and wellbeing of employees and towards business success. The vision of sustainable development – the concurrent development of the internal and external aspects of both individuals and the collective – is missing.

The study has clear implications for the workplace-learning theory. Integrating concepts from chaordic systems thinking to the workplace-learning theory is fruitful. These concepts enable paying attention to the holonic nature of individual and collective learning or, in other words, to the connectivity and interrelatedness of these two levels. Chaordic systems thinking also draws attention to the importance of both the internal and external aspects of workplace learning. For instance, bureaucratic power relations may be an outcome of earlier collective learning, but they equally may compromise further individual and collective learning in actions and awareness.

From the practical point of view, in order to become organizations in which internal and external development may take place at the individual and collective levels alike, the case companies should directly address their shared mental models on power relations rather than leave them to develop accidentally and in an unreflected way. A conscious choice should be made between being a socio-technically or sustainably developing work organization, between being a work organization focusing only on individual learning or being a work organization making room for also internal and external collective learning. In practice, opportunities for exchanging ideas between employees and their supervisors should be provided on regular basis. Employees' initiatives should be perceived as valuable contributions for further development. All in all, employees' possibilities to influence not only their daily work, but also its framework conditions, should be secured. From the management side, there should be enough of a risk-taking mentality to venture to the unpredictable, but certainly important development paths laid down by the employee initiatives.

#### Note

1. In the larger international comparative study, the company-level learning-condition mean values were compared to the available corresponding German data. The comparisons served as rough benchmarks on the level of learning opportunities in the Finnish case companies. In this paper, the results from the comparisons are not presented, but the focus is on the qualitative findings in the case companies.

#### References

- Alasoini, T., Ramstad, E. and Rouhiainen, N. (Eds) (2005), *The Finnish Workplace Development Programme as an Expanding Activity. Results, Challenges, Opportunities*, Tykes Reports 47, Ministry of Labour, Helsinki.
- Barley, S.R. and Tolbert, P.S. (1997), "Institutionalization and structuration: studying the links between action and institution", *Organization Studies*, Vol. 18 No. 1, pp. 93-117.

- Barnett, R. (1999), "Learning to work and working to learn", in Boud, D. and Garrick, J. (Eds), *Understanding Learning at Work*, Routledge, London, pp. 29-43.
- Billett, S. (1995), "Workplace learning: its potential and limitations", *Education + Training*, Vol. 37 No. 5, pp. 20-7.
- Billett, S. (2001), "Learning through work: workplace affordances and individual engagement", *Journal of Workplace Learning*, Vol. 13 Nos 5/6, pp. 209-14.
- Cresswell, J.W. and Miller, D.L. (2000), "Determining validity in qualitative inquiry", *Theory into Practice*, Vol. 39 No. 3, pp. 124-30.
- Crossan, M.M., Lane, H.W. and White, R.E. (1999), "An organizational learning framework: from intuition to institution", *Academy of Management Review*, Vol. 24 No. 3, pp. 522-37.
- Csikszentmihalyi, M. (1990), *Flow. The Psychology of Optimal Experience*, Harper Perennial, New York, NY.
- Dankbaar, B. (1997), "Lean production: denial, confirmation or extension of sociotechnical systems design", *Human Relations*, Vol. 50 No. 5, pp. 567-83.
- Emans, B. (2004), *Interviewing. Theory, Techniques and Training*, Wolters-Noordhoff, Groningen.
- Emery, F. (1995), "Participative design: effective, flexible and successful, now!", *Journal of Quality and Participation*, Vol. 18 No. 1, pp. 6-10.
- Evans, K. and Kersh, N. (2004), "Recognition of tacit skills and knowledge. Sustaining learning outcomes in workplace environments", *Journal of Workplace Learning*, Vol. 16 Nos 1/2, pp. 63-74.
- Fenwick, T. and Rubenson, K. (2005), "Taking stock: a review of research on learning in work 1999-2004", paper presented at the 4th International Conference on Researching Work and Learning, University of Technology, Sydney, December 12-14.
- Fischer, M. (2003), "Challenges and open questions raised by the concept of the learning organization", in Nyhan, B., Kelleher, M., Cressey, P. and Poell, R. (Eds), *Facing up the Learning Organization Challenge. Key Issues from a European Perspective*, Cedefop Reference Series 41-II, Vol. II, Office for Official Publications of the European Communities, Luxembourg, pp. 33-49.
- Fitzgerald, L.A. and Van Eijnatten, F.M. (1998), "Letting go for control: the art of managing the chaotic enterprise", *The International Journal of Business Transformation*, Vol. 1 No. 4, pp. 261-70.
- Forslin, J. (1990), *Det Klipppta Bandet – En VOLVO-Industri Byter Kultur (The Clipped Assembly Line – A VOLVO-Industry Changes Culture)*, Norstedts Förlag, Stockholm.
- Frieling, E., Bernard, H., Bigalk, D. and Müller, R.F. (2006), *Lernen durch Arbeit (Learning Through Work)*, Waxmann, Münster.
- Gerth, H.H. and Mills, C.W. (1985), *From Max Weber. Essays in Sociology*, Routledge & Kegan Paul, London.
- Heckscher, C. (1994), "Defining the post-bureaucratic type", in Heckscher, C. and Donnellon, A. (Eds), *The Post-Bureaucratic Organization: New Perspectives on Organizational Change*, Sage Publications, Thousand Oaks, CA, pp. 14-62.
- Heckscher, C. and Donnellon, A. (Eds) (1994), *The Post-Bureaucratic Organization: New Perspectives on Organizational Change*, Sage Publications, Thousand Oaks, CA.
- Heylighen, F. (1996), "growth of structural and functional complexity during evolution", in Heylighen, F. and Aerts, D. (Eds), *The Evolution of Complexity*, Kluwer, Dordrecht, available at: <http://pcp.lanl.gov/HEYL.html>

- 
- Howard, A. (1995), "Rethinking the psychology of work", in Howard, A. (Ed.), *The Changing Nature of Work*, Jossey-Bass, San Francisco, CA, pp. 511-55.
- Illeris, K. (2004a), "Transformative learning in the perspective of a comprehensive learning theory", *Journal of Transformative Education*, Vol. 2 No. 2, pp. 79-89.
- Illeris, K. (2004b), "A model for learning in working life", *Journal of Workplace Learning*, Vol. 16 No. 8, pp. 431-41.
- Karakowsky, L. and McBey, K. (1999), "The lessons of work: toward an understanding of the implications of the workplace for adult learning and development", *Journal of Workplace Learning*, Vol. 11 No. 6, pp. 192-201.
- Kira, M. (2007), "Learning in the process of industrial work – a comparative study between Finland, Sweden, and Germany", *International Journal of Training and Development*, forthcoming.
- Kira, M. (2003), "From good work to sustainable development – human resources consumption and regeneration in the post-bureaucratic working life", doctoral thesis, Department of Industrial Economics and Management, Royal Institute of Technology, Stockholm.
- Kira, M. and Van Eijnatten, F.M. (2006), "Chaordic work holarchies: towards sustainable development of the organization of work", paper presented at the 6th Annual Meeting of the European Chaos and Complexity in Organisations Network (ECCON), Bergen an Zee, October 20-21.
- Kolb, D.A. (1984), *Experiential Learning. Experience as the Source of Learning and Development*, Prentice-Hall, Englewood Cliffs, NJ.
- Mezirow, J. (1997), "Transformative learning: theory to practice", *New Directions for Adult and Continuing Education*, Vol. 74, pp. 5-12.
- Miles, R.E. and Snow, C.C. (1990), "Organizational fit", in Pugh, D.S. (Ed.), *Organization Theory. Selected Readings*, 3rd ed., Penguin, London, pp. 124-45.
- Nonaka, I. (1994), "Dynamic theory of organizational knowledge creation", *Organization Science*, Vol. 5 No. 1, pp. 14-37.
- Paloniemi, S. (2006), "Experience, competence and workplace learning", *Journal of Workplace Learning*, Vol. 18 Nos 7/8, pp. 439-50.
- Pfeffer, J. (1998), *The Human Equation. Building Profits by Putting People First*, Harvard Business School Press, Boston, MA.
- Sandberg, J. (2000), "Understanding human competence at work: an interpretative approach", *Academy of Management Journal*, Vol. 43 No. 1, pp. 9-25.
- Schoenfeld, A.H. (1999), "Looking toward the 21st century: challenges of educational theory and practice", *Educational Researcher*, Vol. 28 No. 7, pp. 4-14.
- Skule, S. (2004), "Learning conditions at work: a framework to understand and assess informal learning in the workplace", *International Journal of Training and Development*, Vol. 8 No. 1, pp. 8-20.
- Svensson, L., Brulin, G., Ellström, P.-E. and Widegren, Ö. (Eds) (2002), *Interaktiv Forskning – för Utveckling av Teori och Praktik, (Interactive Research – For the Development of Theory and Practice)*, Arbetsliv i Omvandling 2002:7, Arbetslivsinstitutet, Stockholm.
- Taylor, F.W. (1998), *The Principles of Scientific Management*, Engineering and Management Press, Norcross, GA (originally published 1911).
- Thorsrud, E. and Emery, F.E. (1969), *Medinflytande och Engagemang i Arbetet. Norska Försök med Självstyrande Grupper (Participation and Engagement at Work. Norwegian Experiments with Self-Regulating Groups)*, Utvecklingsrådet för Samarbetsfrågor, Stockholm.



- Van Eijnatten, F.M. (1993), *The Paradigm that Changed the Work Place*, Arbetslivscentrum/ Van Gorcum, Stockholm/Assen.
- Van Eijnatten, F.M. (2004), "Chaordic systems thinking. Some suggestions for a complexity framework to inform a learning organization", *The Learning Organization*, Vol. 11 No. 6, pp. 430-49.
- Van Eijnatten, F.M. and Hoogerwerf, E.C.L. (2000), "Searching for new grounds in STS: beyond open systems thinking", in Coakes, E., Willis, D. and Lloyd-Jones, R. (Eds), *The New Sociotech: Graffiti on the Long Wall*, Springer Verlag, London, pp. 39-50.
- Vartiainen, M. (1994), *Työn Muutoksen Työvälineet. Muutoksen Hallinnan Sosiotekniset Menetelmät (The Tools for Changing Work. The Sociotechnical Methods for Mastering Change)*, Otatiето, Espoo.
- Vartiainen, M., Pirskanen, S. and Mattsson, M. (1999), "Ryhmä- ja tiimityö innovatiivisina työtapoina" ("Group and team work as innovative work methods"), in Alasoini, T. and Halme, P. (Eds), *Oppivat Organisaatiot, Oppivat Yhteiskunta, (Learning Organizations, Learning Society)*, Tykes Reports 7, Ministry of Labour, Helsinki, pp. 50-79.
- Wilber, K. (1996), *The Brief History of Everything*, Gill & Macmillan, Dublin.
- Wilhelmson, L. (2006), "Transformative learning in joint leadership", *Journal of Workplace Learning*, Vol. 18 Nos 7/8, pp. 495-507.
- Womack, J.P., Jones, D.T. and Roos, D. (1990), *The Machine that Changed the World*, Rawson Associates, New York, NY.

**Corresponding author**

Mari Kira can be contacted at: [mari.kira@ifa.uni-kassel.de](mailto:mari.kira@ifa.uni-kassel.de)