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**Article**

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Klaus-Peter Schulz, Silke Geithner\*

## **Individual and Organizational Development as Interplay: An Activity Oriented Approach\*\***

We see the contribution of our paper as discussing an integral perspective of individual and collective development. Considering learning and development we suggest a conceptual orientation on activity theory (Chaiklin/Hedegaard/Jensen 1999; Engeström 1987, 2001, 2005). Therefore, we see the workplace as a context where people learn through collective acting and reflecting. According to Engeström we consider learning as expansive development which is brought about through contradictions in daily work and the need to change mindsets. We will refer to two case studies in medium sized firms in the technology and automotive supply industry in Germany. Using qualitative methods of social research (participatory observation, interviews, data analysis) we have analyzed the work and learning activity of production systems. We have described the current demands of the inherent contradictions in the operational work activity. Furthermore, we describe contradictions between the requirements of work and the actual learning methods. Based on these results we develop a platform model of collaborative learning and development.

### **Individuelle und organisationale Entwicklung als Wechselspiel: Ein tätigkeitstheoretischer Ansatz**

In unserem Beitrag diskutieren wir den integralen Zusammenhang zwischen individueller und kollektiver resp. organisationaler Entwicklung. Lernen und Entwicklung wird dabei aus der Perspektive der kulturhistorischen Tätigkeitstheorie (cultural-historical activity theory) betrachtet (vgl. Chaiklin/Hedegaard/Jensen 1999; Engeström 1987, 2001, 2005). Der Arbeitsprozess ist folglich der Kontext, in dem Menschen durch gemeinsames Handeln und Reflektieren lernen. Bezugnehmend auf Engeström definieren wir Lernen als expansive Entwicklung, die durch Widersprüche in der täglichen Arbeitspraxis hervorgerufen wird und den Wandel von Denk- und Handlungsmustern erfordert. Wir diskutieren dies am Beispiel zweier deutscher mittelständischer Industrieunternehmen aus der Technologie- und Automobilzulieferbranche. Mittels Methoden der qualitativen empirischen Sozialforschung wie teilnehmende Beobachtung, Interviews und Dokumentenanalyse wurden die Arbeits- und Lernprozesse in beiden Produktionsunternehmen untersucht. Darauf aufbauend werden Widersprüche in der operativen Arbeitspraxis aufgezeigt und aktuelle Lernanforderungen abgeleitet. Auf dieser Grundlage wird ein Plattformmodell zum individuellen und kollektiven Lernen entwickelt.

**Key words: individual and collective development, activity theory, workplace learning, context, expansive development, production process**

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## 1. Introduction

Many traditional approaches of learning in organizations either focus on the perspective 'individual' or 'organization'. Hence, individual and organizational development is often discussed separate from each other (Wilkens/Menzel/Pawlowsky 2004; Fenwick 2008). In human resource development until the early 1990s, and consistent with the dominant Piagetian constructivist and information processing paradigms in education, mainly the individual was seen as the 'unit of instruction' and the focus of research (Roth/Jin 2006). Although the question of how organizations learn and develop has been discussed since the earlier times of organization studies (e.g. Argyris/Schön 1974, 1978; Cyert/March 1963; Fiol/Lyles 1985), the approach to moving away from the 'individual' towards the 'organization' as focus of consideration gained growing popularity with Senge's fifth discipline in the 1990s (Senge 1990). Although the individual has still been considered as the origin of learning and development in organizations, the relationship between human actor and the entity of the organization is still neglected in most studies (Song/Chermack 2008; Virkkunen/Kuutti 2000). It is instead the change and development of an organization as a whole which is mainly taken into account (Bapuij/Crossan 2004; Fenwick 2008). Hence considering research and the practice of learning in organizations there are two main approaches that can be distinguished between: (1) In pedagogy, especially work based education, the learning of human actors at work is concentrated on (e.g. Boud/Garrick 1999; Dehnbostel 2009; Illeris 2004); (2) In organizational studies, mainly behavioural science, the organization as entity of consideration is focussed (e.g. Dierkes et al. 2004; Geissler 1996; Klimecki/Lassleben, 1998; Schreyögg/Noss 1995). Bapuij/Crossan (2004), Fenwick (2008) and Song/Chermack (2008) who discuss the relationship between individual and organizational learning based on comprehensive literature reviews, state that there is an apparent lack of dialogue across these approaches and the lack of empirical research between individual learning processes and organizational knowledge creation (Song/Chermack 2008, 424). Furthermore they suggest intensive case research as appropriate methodology. Our study pursues exactly these aspects: Subsequently we discuss an appropriate theoretical and empirical basis for the interdependency between individual and collective respectively organizational learning. We therefore follow an appeal by Lompscher and Giest who criticise that current work based learning concepts can be seen as puzzle pieces that do not fit together since they lack a theoretical framework on how organizations can develop (Giest/Lompscher 2006, 9).

Based on ethnographic studies (e.g. John-Steiner 1984; John-Steiner/Mahn 1996) and childhood development research (Rogoff 1990, 1995; Rogoff/Matusov/White 1996), Lave and Wenger developed groundbreaking work through embedding individual learning in a context of collective activity at the Palo Alto Research Centre. Through the model of 'legitimate peripheral participation' they argue that learning always has to be considered as integrated activity between a single person and her social environment (1991). This approach nowadays has been widely adopted from actor centred perspectives in organization studies (Blackler/Regan 2009; Brown/Duguid 1991, 1998, 2001; Chaiklin et al. 1999; Engeström/Blackler 2005; Gherardi 2008; Nicolini/Gherardi/Yanow 2003; Orr 1996, 2006). Characteristic of this model is the

community of practice as unit of consideration and analysis. Legitimization of newcomers (Lave/Wenger 1991), collective action and reflection (Boud/Cressey/Docherty 2006; Cressey 2006; Orr 1996; Reynolds/Vince 2004) and the creation of corporate understandings (Schulz 2008) between collaborating groups are central learning principles among these practice based approaches. Although practice based learning theories consider individual learning and collective development as integral nature and inevitably linked, most of such theories lack concepts for explication and reification (Virkkunen/Kuutti 2000). This consequently leads to the neglect of identifiable structures and entities such as firms, public administrations, networks or supply chains. Furthermore in most situated and practice based learning theories, learning is often understood as an evolutionary process of both, the continuous development of people and the reproduction of systems. Such approach rarely brings about necessary innovation, change and development. Existing concepts of fundamental change such as business process engineering, however, rarely take into account the development of individuals. We therefore do not consider them as being sustainable in terms of organizational and individual benefits.

The newer approaches of cultural historic activity theory (CHAT) in terms of learning and development, mainly brought about at the Center for Activity Theory and Developmental Work Research at the University Helsinki, provide a promising answer according to the basic principles of practice based learning however overcoming the limitations described above. In his late work about learning culture and competence development, Lompscher (2004) provides an overview of activity theoretic based learning and development in work processes. The following principles can be seen as a summation of both research groups, deriving from intensive case studies:

1. Learning is considered as collective activity and dialectics between appropriation and reification (Lompscher 1999). In other words learning takes place through collective practice, but outcomes are explicated and manifested in rules and instruments.
2. Learning is considered as a process of 'expansive development' (Engeström 1987, 2001, 2005) of both, individuals and systems. This means that people further develop through change of their thinking and basic understandings. Such expansive development makes the development of systems possible as a process of collective learning and change.
3. Learning as activity orientates on a shared object among the members of a system. According to the ideas of communities of practice the members share understandings, values and ideas. Although activity theoretic learning takes into account the collectivity as unit of consideration, its shared understandings and the border between collaborating communities (Kerosuo 2006), the model lacks the consideration of formal structures, institutions, such as firms, networks, process chains.
4. Contradictions which occur through collective action and reflection are triggers of questioning existing practice, changing understandings and finally work activity (Lompscher 1999, 2004). The occurrence and explication of such contradictions is therefore essential to bring about learning and system change.

Based on an activity theoretic perspective on learning which we find very powerful to integrate the individual and the collective entity we therefore see the necessity to further expand the idea of activity theoretic learning, focussing on the structural and organizational frameworks of learning (firms, administrations, institutions, networks, process chains). Furthermore we see a demand to bring the theoretic concepts to a more concrete level in terms of industrial work processes. We therefore consider the following operational and administrative production processes in firms, analysing learning and development demands and developing a workplace based methodology of learning what we call a learning platform.

Consequently we consider the following research questions:

- What happens in complex and formalized institutions such as organizations through learning and development of individuals and groups?
- Which organizational effects does the learning activity of individuals have?
- How is the learning activity of people within a workplace inspired, influenced, fostered or inhibited through activity systems and the organization as whole?
- Does activity theory related work research provide an adequate conceptual framework to describe organizational learning activity?

The research is based on two case studies from small and medium sized enterprise (SME) type industries in the technology and automotive sector. Together with the two companies intensive empirical work has been carried out, using qualitative methods of social research, such as interviews and participatory observation. The case studies outline learning demands in complex work organizations that we discuss on the basis of an activity theoretic background and in addition the studies provide approaches for learning as ‘expansive development’ of individuals and organizations. We therefore intend to contribute to the conceptual debate in the field of organizational and human resource (HR) development however with a marked focus on taking practitioners’ demands into account.

## **2. Theoretical background:**

### **An activity theoretical perspective onto learning**

We subsume activity theories among practice theoretic approaches (Miettinen/Samra-Fredericks/Yanow 2009). Research done with a practice theoretic focus implies developing theories and models out of the empirical practice. Such a basic idea is also adopted by most practice theoretic approaches of learning and development: Learning takes place through growing into a specific context and acting within it (Brown/Duguid 1991, 2001; Lave/Wenger 1991; Rogoff 1990). Nevertheless in work contexts such ‘growing into’ is rather a ‘growing together’ or learning through the exchange of knowledge based on the pre-experience of learners (Orr 1996, 2006; Schulz 2008). A widely established unit of analysis is informal and real life cooperation relations, the community of practice (Swan/Scarborough/Robertson 2002; Wenger/Snyder 2000; Wenger 2000). However since many practice theories focus on the emergence of (tacit) knowing (Gherardi 2006, 2008) they neglect the role of explication and general knowledge. Activity theory follows the principle of practice based learning however,

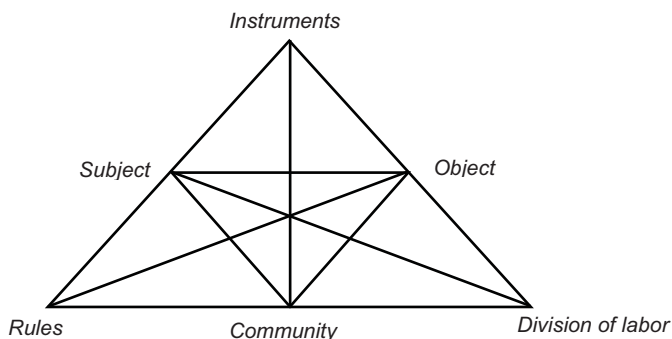
emphasizes the dialectics between appropriation and reification dependent on the tacit and collectively shared background learners possess.

### 2.1 Activity system as unit of analysis

In activity theory the meaning of the social origins of mental processes is emphasized (Leont'ev 1978; Vygotsky 1978, 1987). According to Vygotsky mental functioning of individual people can be understood only by examining the socio-cultural processes within which such function occurs. Hence, activity theory emphasizes the socially and historically derived nature of practice. The term practice refers to day-to-day activities in their 'entire richness.' Activity is driven by an object-related motive. According to Leont'ev (1981), activity is realized through actions driven by goals. Collective activity is connected to object and motive, of which the individual subjects are often not consciously aware. Individual action is connected to a more or less conscious goal. Activity is always collective and never without an object. An activity system produces actions and is realized by means of actions. However, activity is not reducible to actions. Actions are relatively short-lived and have a temporally clear-cut beginning and end. Activity systems evolve over lengthy periods of socio-historical time, often taking the form of institutions and organizations. The distinction is crucial in so far as it is possible for individual action to be understood as part of a collective activity of a social community.

Work practice could be described with the concept of the *activity system* which includes the subject, the object, the used instruments, tools and artefacts, the specific form of division of labor and the community with their implicit or explicit rules of cooperation (Engeström 1987, 78). The activity system is the basic unit of analysis and represents real cooperation relations. This system is a result of specific socio-historical conditions, and represents ongoing inter-personal interaction mediated by various tools.

**Figure 1: Activity system** (Engeström 1987; 2001)



However, practice does not emerge as 'given' in human activity but requires the engagement of practitioners who create their historical realities and collectives in pursuing activity (Engeström 2000a, 2000b; Lompscher 2004; Miettinen 2000). Therefore, activity systems cannot be viewed as static entities. These systems and their constitutive elements are constantly re-constructed in mutual interaction. Contradictions in

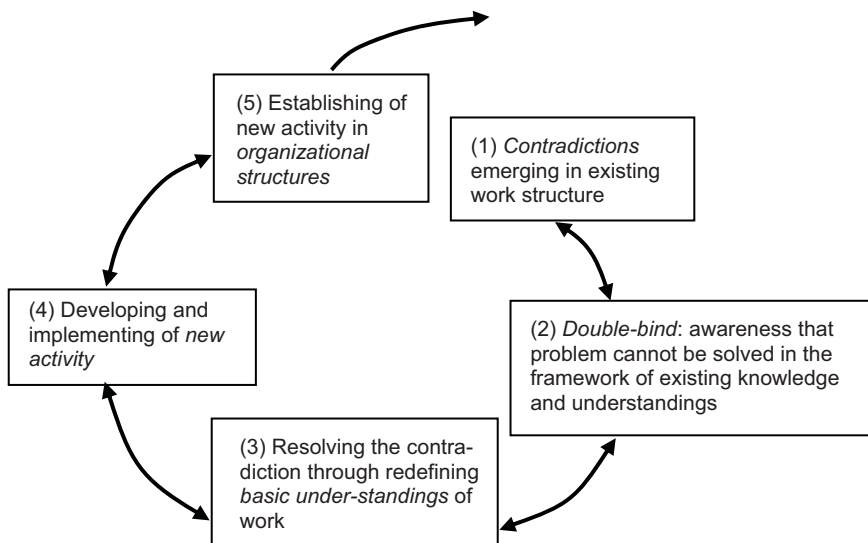
and between the elements of the activity system triggers their development. From an activity theoretic view contradictions are disturbances, breaks, structural tensions or different understandings.

## 2.2 Learning and development out of an activity theoretic perspective

In reference to learning and development the central questions are who learns and what is learnt. In answer to the second question, Engeström refers to Gregory Bateson with his steps of learning (1972). Bateson basically distinguishes between three stages of learning. The first is a mere reproduction of knowledge, its application and modification of experience due to the demand of differing situations. In the second stage the learner gains methodological capabilities on how to learn – how to modify and adapt practice according to different contexts. The third stage requires a fundamental change of existing understandings and convictions from the learner. Bateson defines it as development since learning goes beyond the existing horizon of the learner to what he calls ‘deutero learning’. At this stage Bateson’s learning model should be distinguished from the organizational learning model of Argyris and Schön (1978). Although they also refer to a three step model they understand learning to learn as highest level and see the change of backgrounds below (double loop learning). Considering the relationship between individual and organization and from an activity theoretic perspective we suggest to refer to the model from Bateson (see also Lompscher 1999).

Activity theorists define such learning as expansive development or learning activity. According to Leont’ev’s basic understanding that activity is always of a collective nature (1978), Engeström emphasizes that expansive learning affects a whole activity system and therefore cannot be reduced to a single person (Engeström 2000a, 2001; Leont’ev 1978). Therefore learning as development should be considered as collective. Engeström (1987, 2001) describes learning and development with the *cycle of expansive learning* (see also Vygotsky 1978, 86):

Figure 2: The expansive learning cycle (Engeström 1987; Virkkunen/Kuutti 2000)



1. A primary contradiction emerges through problems or interventions in the existing community that question existing practice.
2. Analysis of the situation leads to the result that the primary contradiction cannot be solved on the basis of existing understandings and knowledge - a double-bind situation occurs.
3. Activity within the community has to be redefined through questioning and by changing basic understandings and current assumptions of work.
4. The new model of activity has to be implemented, which may cause additional contradictions depending on whether the theoretic assumptions taken in step 3 bear close examination to work practice.
5. A change in work practice cannot be seen as a singular action of one individual or group. As noted earlier, a further contradiction is likely to occur when the new practice is established within an organization.

The cycle of expansive learning is considered to be a process of individual and collective development (Engeström 1987, 2001; Virkkunen/Kuutti 2000). The single steps, however, do not have to be followed in succession. Recursive loops may occur at any point. A main source for contradictions are the relations between the elements of the activity system, e.g. between rules and division of labor, or between the instruments and the object of the community. Solving such contradictions leads to the development of the activity system and the people involved. However, one should be aware that the process of expansive learning does not necessarily lead to a positive result. It may be abandoned at any steps if contradictions can not be solved and the community resistance avoids changing general assumptions and the realization of new activity. Although, the analytical level of 'organization' has not yet been defined (Schulz 2008, 462), expansive learning as process of developing activity and activity systems can be seen as a fundamental model in integrating individual and organizational learning (Engeström/Lompscher/Rückriem 2005). It is a central insight of the expansive learning model that collective (organizational) change and learning can only take place if individuals expand their assumptions and understandings beyond their existing level. In contrast to most understandings of communities of practice, the influence of a formal set of rules, legal framework, and division of labor is taken into account within the activity system model. Therefore it includes an institutional perspective of learning and development. In the study of learning and development in work processes, the model should be expanded towards structural models of complex process chains and cooperation structures (Geithner/Schulz 2009).

### ***2.3 Consequences of expansive learning related to industrial work processes***

The definition of activity systems within work structures rarely follows formal departments or teams. Since a general principle of the activity system is a shared object of work, it instead represents cooperation relations beyond structural borders including formal organizational artefacts. In general activity systems follow product groups and process steps including productive and administrative functions that refer to a shared object. Focussing the model of expansive learning on industrial production processes the following assumptions can be made:



- Learning takes place within a specific context such as a process step, a field of cooperation, or a production (Lave/Wenger 1991), which is appropriately described through the model of activity system (Engeström 1987, 2001, 2005).
- Learning leads to the development of individuals and work systems or process steps if contradictions in existing activity occur and basic understandings of work processes are changed. Contradictions between the various actions and artefacts of work can be seen as nucleus cells of organizational change and development.
- Learning by expanding is likely to lead to change in activity and therefore in forms of collaboration, structures, artefacts and entire work systems. It can therefore be seen as organizational learning.
- Activity systems interact with each other and envelop each other, such as the core production process with administrative support processes and supply processes. Change within one activity system effect others surrounding (see Kerosuo 2001; Kerosuo/Engeström 2003).
- Activity systems are embedded in a set of formal structures and rules: organizations, networks or ventures. Different power relations between activity systems exist within the organization (Lompscher 2004).
- ‘Organizational learning’ – namely change and development – requires the expansive development of the individuals involved in the organization or network. Hence a mere adoption of new organizational principles or technology on the operational work level can rarely lead to change and development at the institutional level. It is instead the collective change of general assumptions and understandings followed by the change of activity that brings about ‘organizational learning’. In a SME such a process is likely to involve companies as a whole, in large corporations most likely only specific fields are affected, such as business units or process chains.

Subsequently we consider demands, prerequisites and principles of learning, change and development in the production area of two SME-type companies. We will especially discuss how the learning of individuals and organizational development can be enabled and fostered.

### **3. Case studies: Working, learning and development in SME**

The two case studies from the automotive supplier and technology industry represent global acting medium sized enterprises situated in Germany. The competitiveness of the firms depends on continuous innovative product and process development. Although the case study examples tell specific stories of specific industries they also show the complexity of work processes and significant principles on how the world of work is changing (Barley/Kunda 2001) and therefore how the demands on individual and collective learning and capability development are also changing (Ardichvili 2003; Engeström 2008).

In using qualitative empirical methods we have analyzed the work activity of production systems (operational, administrative work and leadership) in the two companies. The focus was, derived from an organizational perspective, on the deduced de-

mands on learning and development; the learning methods applied in the firms and the organizational effects of individual learning. In this context, we strive to discuss work requirements, context specific factors and the discrepancies between organizational requirements and learning practice on an actor's level. Our empirical research aims to consider and interpret work and development practice in organizations from an activity theoretic view, and subsequently to discuss the aforementioned assumptions of learning and development in the light of these cases.

### 3.1 Research questions and methodology

Barley/Kunda (2001) as well as Engeström/Blackler (2005) criticize that often work and organization research is based on selective studies based on quantitative data that hardly mirror the complexity, dynamics and history of organizational contexts. The researchers therefore suggest in depth case studies which are based on observation and meticulous recording of day-to-day activities. Lompscher (2004) argues in a similar manner, however he emphasizes the necessity to interpret case studies on a strong theoretical basis. According to the principles of practice and activity theoretic research it is the process with its development and critical aspects which is explored, instead of describing the status quo and outcomes of an activity (Kerosuo 2006; Schulz 2006).

**Figure 3: Issues and methods of the empirical research**

Research issues	
<ul style="list-style-type: none"> <li>– situation of the firm: company goals, production systems, future challenges, business environment</li> <li>– organization of work: actors, division of labor, communication and cooperation, rules and basic assumptions, work equipment and tools</li> <li>– development of work and contradictions within the work process</li> <li>– current learning-approach and methods such as human resource development (HRD) and continuous improvement process (CIP)</li> <li>– sources of contradictions between learning methods and work practice</li> <li>– major fields of learning and development to be identified</li> </ul>	
Research methods	
<i>Case study 1: automotive supplier</i>	<ul style="list-style-type: none"> <li>– 28 days participatory observations</li> <li>– 31 interviews</li> <li>– document analysis (e.g. process and job descriptions)</li> <li>– period: April – June 2009</li> </ul>
<i>Case study 2: technology company</i>	<ul style="list-style-type: none"> <li>– 18 days participatory observations</li> <li>– 47 interviews</li> <li>– document analysis (e.g. process and job descriptions)</li> <li>– period: May – July 2008; November – December 2009</li> </ul>

Thus practice-based research follows the basic principle of action research (Lewin 1946, 1947); in-depth fieldwork is the primary source of new knowledge and draws trajectories of activity and its development (Kerosuo 2006, 91). Hence we are aware of the limitations of a small number of cases as theory generating research on the one hand, nevertheless on the other hand the cases have been intensively researched using

a multi method approach and are interpreted in the light of an intensively reflected theoretical basis. Primary methods that we used have been participatory observation and semi structured interviews (a total of 78 interviews). To provide a comprehensive picture of the companies in general, we surveyed employees from all business areas (administration, production, management), including service providers and customers (see figure 3).

### **3.2 Case descriptions and outcomes**

#### *Case Study 1: Automotive supplier*

##### a) Current situation:

The firm produces engine parts for the international automotive industry and is a world market leader in assembled cylinder head parts; since they own the patent on a specific mounting technology. This patent provides a cost effective manufacturing method and a low weight product. The firm belongs to a group of five firms under the roof of a holding. Nevertheless, the considered company represents mid-sized structures. Production started in March 2007 and was motivated through the demand of one of the important customers located in the region. Additionally the car-manufacturer out-sourced the finishing process of the cylinder head parts (one core step of the production processes) to this company. About 20 workers were absorbed as a consequence of the sale. The production volume of the company is directly linked to the actual demands of the car-manufacturer. Therefore, production and work processes need to be flexible depending on the orders of their customers. In 2009/2010 the company will establish two new production lines for new customers. More workforces will be necessary. Currently 85 people are employed, including 20 in research and development (R&D). R&D is of great importance for the firm. Therefore, the focus of activity is both on the production of cylinder head parts and on the research of possible new developments related to cylinder head functionalities. At the strategic level the current challenges are attracting further customers and the expansion of R&D with the task to expand the product functionalities since the original patent expires in a few years.

##### b) Outcomes production system and organization of work:

On the shop floor there are four different manufacturing cells: part production, assembling, turning and the grinding line. Only the part production and the assembling are related and subsequent process steps. That means there is no consistent process in the manufacturing. The turned or grinded products were manufactured in one of the other companies of the group. At the start of production in 2007, 20 workers from the customer were absorbed and many people were employed at the same time. In the field of R&D it is striking that the basic research is to take place at the site, the prototyping at another location and then the production is done at this site or in other locations. In the process, both in manufacturing as well as in the R&D there is therefore various dissension. The employees have no knowledge of the overall process. Therefore, the firm has several integration and coordination problems.

“In the manufacturing plant each one operates for himself. That’s the fact because everyone cares about his own stuff. There is no team feeling.” (Production manager)

“I do not like that I am alone at the assembly line. It is very isolated.” (Production worker)

“The cooperation depends on the departments, since especially the R&D people are in their own world. Sometimes they lack understanding of other things.” (Administration manager)

c) Outcomes learning methods and learning demands:

From a learning perspective crucial questions are: How can the employees grow in the work context and how can workers grow together? How can a shared object of work be developed which includes shared knowledge and understandings about the work? Hence the building of efficient cooperation relations (teambuilding) and collective development processes (role taking and making) are major requirements.

“Problems identified should be pursued more intensively. The information flow between production and planning needs to be improved. Only well qualified staff maintains the quality of products.” (Team leader production)

Currently the HR-department uses training plans with every person on display. The plans include all necessary process steps to produce and deliver the products and have to be implemented by the workers within one year for the adjustment to a new job. The supervisor is ultimately responsible for the training of workers but the HR-managers are not informed about the proceedings. Furthermore, the focus is on technical and professional qualification.

“For me, it is part of their work. They have to do this. We do not make it so clear. This is perhaps even stupid but I just go ahead and do it. I think they know that. But I do not know exactly.” (HR manager)

“We have to learn teamwork in the field. Each one understands how he creates conflicts. How can I understand my conversation partners especially in this cross-site collaboration? Team training has not yet been implemented. Thus, we have a lot to work on. This allows us to solve cross-site conflicts.” (Head of R&D department)

The results of the interviews show that human resource development (HRD) and continuous improvement process (CIP) is often neglected and stands behind operational work. Learning depends on individual initiative however, adequate resources for coordination and support are lacking.

“I would like to continue to educate myself. Yes, I have already communicated that fact. So far, no-body responded.” (Supervisor)

“There is a strong need for training which has already been required at different places. CIP suggestions should be taken seriously and not rejected due to reasons which are not comprehensible for us.” (Production worker)

“I deleted suggestions for the improvement process after I wrote them because they do not interest anyone here.” (Production worker)

The employees see several improvement opportunities in their working area, but suggested ideas for the continuous improvement process have not yet been implemented. Furthermore, the employees often have to work under pressure and in their point of view they feel insufficiently educated to meet the demands of their work without problems and at all times. Particularly, mutual support to learn the new job was missing.

“We would prefer training rather than strictly ‘learning-by-doing’.” (Production worker)

### *Case Study 2: Technology company*

#### a) Current situation:

1996 after the German reunification the firm emerged out of a large technology company. The firm develops and produces control cabinets for production machines and technical constructions for more than 160 customers (e.g. automotive manufacturer). About 250 people work in the control cabinet production area. Anyone who operates in the highly competitive environment of control cabinet production needs to offer their customers something special in order to be successful. The firm distinguishes from their competitors by covering the entire value-added chain: They collaborate with their customers very early in the development phase and if required, they can produce complete automation concepts. Increasingly important is the production of small series and one-offs. In such cases efficient planning and production is particularly important. Hence, the company endeavours to accelerate work operations and respond quickly to differing orders and customer requirements without compromising its high quality standards. The challenges of the firms lie in distinctive customer orientation and in a higher product complexity due to reduced size and an increasing number of components in the control cabinets. In addition, the minimization of the lead time is a decisive factor in control cabinet manufacturing. The individual customer-specific manufacturing, dependence on the date loyalty and the management of errors are the most important challenges.

#### b) Outcomes production system and organization of work:

The firm produces in two different plants: the main plant includes a new shop floor and the remote production site consists of old buildings with sub-optimal production conditions. Its reason for the remote production site is to provide flexible manufacturing resources. The production process is very complex and includes more than ten single steps: coordination with the customers, order management (conceptualization, consulting), engineering, logistics material, mechanical production, electronic production, testing, logistics of delivery, assembling and the initiation into service.

“I would even say that half the work is clarification about the differences in processes because we do not have a standardized commodity business. But this is our job.” (Production manager)

In both plants the complex production process requires an exact coordination between the involved teams such as the order management, production line or mechanical testing. But between the processes in one plant as well as between both of the plants there are difficulties in coordination, especially in the flow of the materials and information:

“The raw materials stock is still at the main site. You cannot just quickly go there when a part is broken or if one is missing. Organization is even more necessary.” (Staff office, remote production site)

“I would like more far-reaching information. If a person really wants to have information, that person really has to take care of getting it himself I think.” (Team leader, remote production site)

“The information explosion is very large. The quality of the information could certainly be improved too. The important thing is that a person doesn't have to ask about every lit-

tle thing. Information processes could be more effective and flexible.” (Team leader, logistics)

Moreover, as way of increased flexibility the firm cooperates with many other firms that either produce the mechanical cabinets or the control cabinets as a whole. These cooperating firms are located within the same buildings and sometimes even within the same production shed. Organizational borders are difficult to identify and not clear for the employees. The firm often criticizes the quality of the products and the adherence to delivery dates. Additionally a lot of temporary workers are used.

“The cooperation is quite slow. They're just not as open as when I go to my own people, who can tell me the same things. Among the partners the contact person is always the boss. The workers are always telling me they shouldn't tell me anything and shouldn't even be communicating with me.” (Employee quality control)

“With the cooperation partners, I think it is just harder to enforce an understanding of the fine-tuning for finest quality, which I have as the highest requirement. The partners have a different comprehension of what that means I think.” (Team leader production)

c) Outcomes learning methods and learning demands:

The production processes as well as the work processes are very complex with many interfaces and borders. Furthermore, from the employees' point of view the tasks have become more and more extensive and multifaceted. The proneness for error has greatly increased. However, the employees do not feel sufficiently prepared for these changes and feel as though they have been ‘thrown in at the deep end’.

“I have learned a lot on my own by ‘learning by doing’ and simply made decisions. At some point it will be clear as to whether it was the correct thing to do or not. If it wasn't the right decision, we'll have to make the necessary changes.” (Team leader, logistics)

“An employee will most often lack the necessary preparation.” (Employee administration)

Currently, training focused on individual jobs. The focus is on technical and professional qualification that neglects communication and cooperation aspects. Furthermore training does not correlate with the process chain but considers traditional department structures. Therefore, the temporary workers and the employees of the partners involved are not integrated in the learning process and hence do not have the overview of the whole process chain. They lack background knowledge and understanding about the context and interrelations.

“We can not integrate a new employee in one or two days. It is highly customized.” (Employee order management)

“We actually have fewer team meetings. With the present 40 temporary workers, there is too little time to worry about such things. They want to know what they need to build, how much time they have to do it in and everything else is less important.” (Team leader production)

In addition to classical training the company has a specific the CIP program. Participants in this program are primarily managers and team leaders. More than half of the surveyed workers denied their participation in the CIP programme. The workers are well aware that there is such a program, but cannot explain what's behind it.

“Yes, CIP, we can submit suggestions. I can not tell you what that CIP program means. In case we have improvement suggestions or ideas for facilitation we submit them.” (Production staff)

### **3.3 Case studies: Discussion**

The case studies represent individuality and complexity of the work processes. Process steps are interwoven and require intensive coordination and process communication. The 'real life' work processes differ from formal structures and inter-organizational borders (e.g. Engeström 2008; Wenger 2000). Informal cooperation structures such as activity systems can be described (Adler 2003; Engeström 2001, 2005, 2008; Sydow/Lindkvist/DeFillippi 2004). The units of analyses and therefore the learning focus should depend on these informal structures since the formal structures and layouts rarely mirror the cooperation paths and activities. Therefore shared objects of activities are difficult to identify and to explicate. Nonetheless to bring about individual and organizational development through work based learning activity which takes into account required instruments, rules and shared labor, the shared objects of activity need to be identified (Virkkunen/Kuutti 2000).

Both companies are entirely aware of the meaning of staff learning. They see the direct link between individual learning and organizational development. Their learning strategies, however, mainly focus on the individual. Too little effort is taken to find out adequate subjects of learning and objects of cooperation. However complexity of work practice shows that such identification is nothing more than trivial and requires some analytical and empirical effort. Consequently learning merely remains an adoption of actual demands neglecting the aspect of (collective) development and change (Ardichvili 2003). Furthermore work demands prove that individual development, problem solving and reflection capabilities are required (Boud et al. 2006). These are rarely covered through the learning strategies within the firms.

The lack of shared understanding is considered as being crucial in both cases, however apart from information actions little effort is taken to overcome these deficits, especially in terms of far-reaching shared assumptions about the motive of work. Hence training does not focus on major demands. As a consequence workers improve their capabilities through learning by doing despite being dissatisfied with its effects. On an organizational level learning as well as conceptual work effects are rarely reflected and reified. The lack of awareness of the realistic cooperation relations and of the shared objects and of institutionalised and open reflection, where different functions and levels are involved (ibid.), makes it rather impossible to identify, explicate, analyze and discuss contradictions and understandings. Nevertheless such a procedure can be seen as essential for expansive learning and thus organizational development. As a result learning remain unevaluated and thus the (tacit) property of individuals. This does not mean that organizational development does not take place, but that the potentials of organizational learning are not exploited since individual learning is not aligned with organizational development procedures. Hence due to the inadequate structures and the individualistic understanding of work and learning the companies fail to use their chances for staff learning in a sense of development and therefore for organizational change and development.

In interpreting the cooperation relations with the analytical model of the activity system, both cases however, show that to a great extent significant contradictions exist between staff qualification and work requirements: The applied tools for individual

learning (training plans) and organizational development (Continuous Improvement Process) do not complement one another. Learning and development of the organization is not a relevant object on the operational work level or on the management level. Objects are reduced to output, process (product delivery) or person (staff qualification) oriented.

The firms include a bundle of different process chains meeting individual customer's demands. Therefore the focus of the development should not mirror the organization as a whole, since demands of the process chains differ significantly. Therefore it is again the object of consideration with the affiliated activity system which has to be identified to figure out the adequate unit for learning and development (see also Virkkunen/Kuutti 2000). Hence learning strategies should focus on the objects, communities and process chains rather than the firms as a whole.

Out of the empirical surveys the following contradictions can be identified in operational work that lead to learning demands and provide potential for organizational or process chain development:

**Figure 4: Contradictions identified in the case studies**

	<i>Case Study 1: automotive supplier</i>	<i>Case Study 2: technology company</i>
<i>contradictions in operational work and learning demands</i>	<ul style="list-style-type: none"> <li>– The employees have no knowledge of the overall process. Therefore, the firm has several integration and coordination problems.</li> <li>– Feedback institutions such as improvement processes exist, however they are often not taken into account in work reality.</li> <li>– The setting up of the production requires learning and institutionalized procedures. Reality however is based on 'learning by doing' and informal acting.</li> </ul>	<ul style="list-style-type: none"> <li>– The quality requirements are contradictive to the time pressure and lack of communication and feedback procedures in production.</li> <li>– Product and process requirements on increase significantly.</li> <li>– The increasing complexity in production reduces workers to experts in a narrow field. They lack process overview and product related knowledge.</li> <li>– Fluid and changing borders between temporary workers and embedded suppliers. They lack of a collective shared understanding with the members of the company.</li> </ul>
<i>contradictions between learning and work practice</i>	<ul style="list-style-type: none"> <li>– HRD rarely takes into account the demand on communication and cooperation capabilities required to build up the new production.</li> <li>– The role and benefits of learning and feedback institutions such as CIP is not clearly conceptualized and its realization is left behind.</li> </ul>	<ul style="list-style-type: none"> <li>– Training focuses mainly on new technology such as machines or procedures, neglecting social and communication processes.</li> <li>– Training is mainly instructional and event oriented without feedback procedures on the process. In the workers' minds HRD is related to instructional classes or seminars and not as a built in part of the work development.</li> </ul>

It can be finalized that in both cases the practice of learning as training sessions or learning by doing does hardly meet the requirements of the work practice. The development concepts fail to meet work reality and to bring about a collective reflection and development process. Learning is often related to the acquisition of knowledge and not how to act collectively within a specific context (e.g. Yanow 2004). Especially the systematic acquisition of social competencies that would enable employees to communicate and coordinate adequately is neglected. Learning is related to (external) training classes. Learning at the workplace is mainly unsystematic, un-reflected and operational managers are in charge and lack time and coaching knowledge. Additional-



ly hardly any systematic feedback loops on outcomes and relevance of learning for operational practice exist. On a higher management level however, the strategic awareness subsists that staff qualification contributes to organizational development. Therefore the cases show that methodology, which could bring about learning activity and therefore organizational development, barely exists within the case companies. Current learning applications in HRD and CIP can contribute to a collective/organizational development process but only in a limited way. The case studies also show that it is not a specific elaborated learning curriculum which would solve the problems on learning but the lack of a general understanding and awareness of learning as a collective activity and therefore organizational development (and its implementation) within the companies. Hence it is the question of how learning activity and development can be embedded in practical work and be reflected on due to the requirements taken out of the work context. Further case studies show that organizations need support to develop a basic understanding of learning activity as organizational development, and to apply adequate instruments that support collective learning. As a possible solution we therefore suggest a general conceptualization of learning and development that focuses on work activity and the object (motive) of such activity. We see a promising solution in a platform model of learning which we describe in the following chapter.

#### **4. A platform model of learning**

The platform model is derived out of our theoretical conceptualizations of learning activity in organizations and out of the experiences of multiple empirical cases (Engeström 2008; Kerosuo 2006; Lompscher 2004; Schulz 2005; Schulz/Geithner 2010). The above case studies illustrate and stress that there is a strong need for institutionalization and methodological support to provide the capability for learning activity. We suggest a structural model of a platform where representatives of work processes and work meet for exchange, learning and development (Ciborra 1996). Number and origin of the platforms participants depends on the content to be discussed and developed, however participants on one hand should not be too close to each other and on the other hand most of the participants should share an object of consideration in daily work (Engeström/Blackler 2005; see also West 2002). This learning and development model takes into account two levels: the secondary activity 'reflection platform' and the primary activity 'operational practice'. Participants meet on the platform - a space and time slot for collective acting, discussing and reflecting apart from their daily work - on a regular basis. Issues to be discussed derive from the operational practice of the participants. The learning platform can on the one hand be considered as an activity system on its own developed by its participants through collective acting and reflecting. On the other hand activity systems as well as the interaction between activity systems can be visualized through collective discussing and reflecting on platform level. Through the collective exchange on the platform it is likely that contradictions of daily work are brought into light. Furthermore new contradictions are likely to emerge through the different views of the platform participants. Such contradictions can be in or between the elements of an activity system or between two or more interacting ac-

tivity systems. The concept of activity system provides dimension and categories in describing contradictions in a concrete way.

Depending on the mutual focus of the participants, the results of the cooperation could be an exchange of singular problems such the introduction of new tools on the production line in case one or of complex concepts on specific themes like new forms of division of labor or new understandings of communication between cross-sites, cooperating firms or e.g. in the case of the technology company (Ciborra 1996; Schulz 2005). Moreover, when persons in charge of learning like HRD or CIP managers discuss and reflect together with workers on platform level work practice with a focus on activity and systems, a collectively shared understanding of learning demands is likely to develop. Following the expansive learning cycle HRD/CIP managers can facilitate individual and collective development and therefore take over the role of moderators instead of top down designators of learning needs.

Once the platform participants are back at their workplace (primary activity), questions arise in terms of what relevance the platform cooperation has for operational activities. Therefore outcomes from the platform level have to be discussed within the colleagues at the workplace. Ideally the ideas are transferred to the specific operational situation and realized at the specific workplaces.

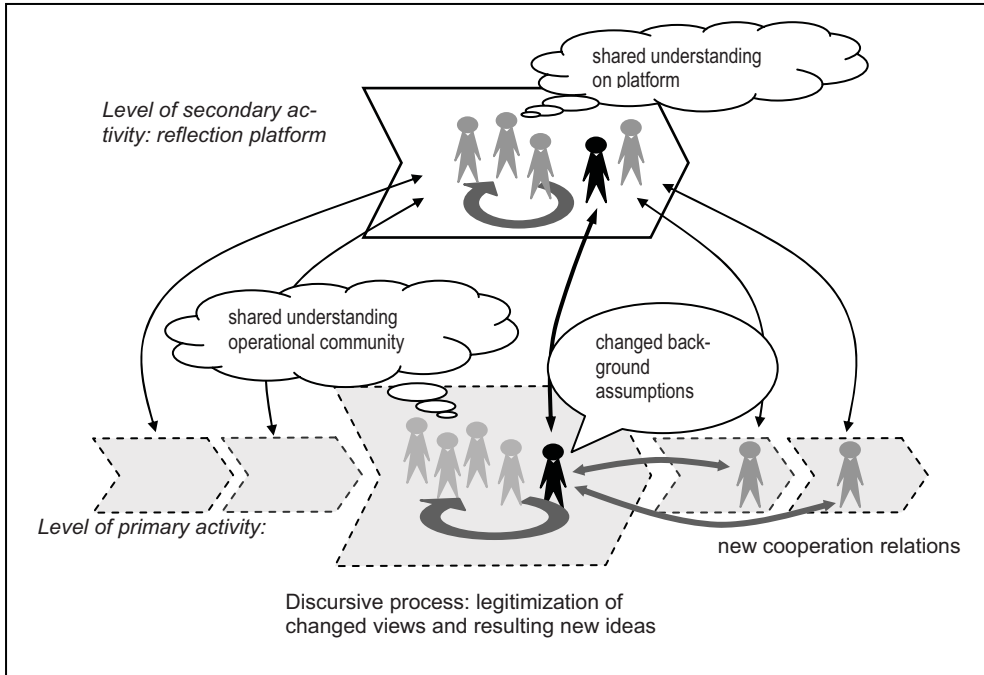
We view the combination between platform and operational practice as close interdependence, since problems are sent to the platform where the topics are reflected and assessed. Ideas and solutions are brought about, are transferred back to the communities participating and are applied in daily work practice. Moreover, experiences of implementation can provide feedback and further discussion on the platform level. However one should distinguish the following characteristics between platform and operational work practice: On the platform level differing viewpoints come together and cooperation is typified through goal oriented cooperation at a conceptual stage. Discursive processes are instigated through the clarification of contrary standpoints and through the discovery of a mutual solution. At the operational level, daily work requirements dominate cooperation. Platform outcomes are either neglected or thoroughly discussed in the light of their benefits for the operational practice. Power relations and individual interests have to be taken into account.

The design of the platform can be according to the company's requirements. It can be a discursive process similar to CIP. Other methods applied can be creativity techniques, business games or even an alternation between instruction and testing. Topics to be introduced should however always mirror a complex sequence of the operational work process and not be reduced to abstract learning issues, such as 'leadership', 'key figures' or 'communication'. The platform model is not an issue of knowledge transfer but of a dialectic relation between primary activity on operational practice and secondary activity on platform practice. From our point of view this relation is essential for individual and collective development, an aspect that qualification concepts frequently neglect.

Learning may occur on the platform level or on the level of operational practice. On both levels each learning step can be specified. Learning on the platform level is not necessarily related to expansive development. It can include mere exchange and

search for solutions over problem solving methods. Finally ideas of change for the whole system can be developed (expansive learning). Learning at the operational practice is mainly triggered through the outcomes of the platform. It can be seen as a form of appropriation of the platform ideas and concepts in work practice. While acting, practitioners are put in a position to re-create their practice (see also Lave/Wenger 1991) – in other words: the re-creation of practice may lead to organizational development and individuals learn through re-creating their practice on operational work level.

**Figure 5: The platform model of learning and development**



The platform should be seen as an institutionalized space for reflection and reification of operational practice rather than a didactic principle. Didactics may be integrated in the platform activity due to actual demands. However, referring to the empirical results, it is especially the creation of a shared object and the resolving of contradictions which is required to enable expansive learning of the people involved in the organization. Supporting and fostering this process requires methodological capabilities. Therefore, similar to CIP platform related learning and development processes need to be assisted and mediated.

## 5. Conclusion

Considering individual and organizational learning and its interplay we argued that such categorisation is of little help either from a conceptual or from a practitioner position. We especially criticize that on the one hand individualistic learning theory neglect context and collective aspects. On the other hand the concept of organizational

learning hardly says anything about who learns and what is learned. We therefore suggested a practice theoretic perspective, namely an activity theoretic approach towards learning. Based on the work of Bateson, Engeström and Virkkunen, we argue that an adequate unit of research should be a process of actual work cooperation, which could be similar to an organization or go beyond its borders. Similar to a community of practice models such structures and relations can be described with the analytical model of the activity system. A complex work process is ultimately comprised of several interacting activity systems. According to Bateson different stages of learning can be described. The highest level, that Engeström calls ‘expansive learning’ is of collective nature and requires the change of general assumptions and understandings. According to Engeström we argue that such a stage of learning is necessary that work systems (organizations, networks) can change significantly and develop as a whole. Such process of development requires a shared object of consideration among the members of a work system and the explication and resolving of contradictions. Hence there is a direct link between the development of individuals and the change and development of work processes.

The empirical examples illustrate that such correlations in terms of learning, change and development are often neglected either from a conceptual side and learning practice in industrial work processes. We therefore suggest that framework conditions have to be created where contradictions can be reflected and resolved and development can take place. A moderated platform where participants of work systems meet on a regular basis for corporate action and reflection can be a powerful tool to enable the discussion of contradictions and to bring about new solutions. Although several examples exist (Engeström et. al. 2005; Schulz 2005; Schulz/Geithner 2010) further research needs to be done as to how such platforms should be created and what mid term effects they may bring about.

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