

**International Conference on Organizational Learning, Knowledge and Capabilities
(OLKC)**

12-14 April 2011

Hull University Business School, Hull, UK

“Making Waves”

**The development of shared understandings and innovation through metaphorical
methods such as LEGO Serious Play™**

Klaus-Peter Schulz

Department of Factory Planning and Management

Chemnitz University of Technology

schulzkp@hrz.tu-chemnitz.de

Silke Geithner

Department of Organization Studies

Dresden University of Technology

Silke.Geithner@tu-dresden.de

Keywords: shared understandings, innovation, LEGO serious play, metaphors

Abstract:

Heterogeneous project groups can be seen as a driving force in innovation and organizational development processes. However the participants of the project need to be able to communicate and collaborate on the basis of a shared understanding. The development of a collectively shared understanding, which is based on the individual backgrounds of project participants, can be seen as an intensive and time consuming process of growing together. In this paper we will therefore discuss the metaphorical method LEGO Serious Play™ (LSP), which is based on bricks building, combined with narration, to simplify the process of developing shared models. Our research refers to a case study of a research process where LSP has been used to develop a research structure.

1. INTRODUCTION

Innovation, change, and learning within work processes are significantly influenced by the ability of the process participants to develop collectively shared solutions. The therefore necessary development of new ideas is more likely if work practice is reflected within heterogeneous groups (West/Farr 1990). However the more heterogeneous such groups are, the less likely is a shared understanding about meanings, intentions and work as a whole. The diverse views from representatives of different fields on one hand limits understanding on the other hand it challenges existing views and inspires to bring about new ideas. The balance between shared understandings and diversity among community members can therefore be seen as essential to enable groups to create new ideas and solutions in collective reflection processes (West 2002; Schulz 2008). We, therefore, see a demand to discuss methods on how participatory change and learning processes can be organized and especially how the development of shared understandings, as an initial aspect of innovation and development processes, can be facilitated.

Our starting point is a platform model of change and development (e.g. Ciborra 1996; Schulz 2005; Schulz/Geithner 2010), which can be seen as a reflection activity of operational work. We focus on the aspect of how heterogeneous groups meet and how they express their diverse perspectives and develop a shared object of consideration (Engeström/Blackler 2005). We particularly consider the method *LEGO Serious Play*TM, which has been developed to support strategic planning processes, project work and team development in organizations (Roos/Victor 1999; Roos et al. 2004). Through the LEGO Serious Play (LSP) method, metaphors are created and shared through the combination of physical building and narration. The conceptual background of the method lies in the fields of organization development, psychology, and management learning. We consider the easy application and the combination between building and storytelling of LSP powerful aspects to express backgrounds and meanings. Therefore in the following we will discuss the method and its application in innovation and development processes. Our research question can consequently be verbalized as follows: How to create shared understandings in heterogeneous manned innovation and development processes?

The process of people gathering together and exchanging different perspectives is characterized through intense communication (Boland and Tenkasi 1995). In project work communication is mostly verbal, partially supplemented by power point slides, tables or figures. Hence team members express meanings through verbal explanations or sketches. Understanding is created through ongoing communication and exchange as a process of “growing together” (Lave/Wenger 1991; Baitsch 1992). Often, such communication is characterized through misunderstandings and contradictions (Engeström 2008). However, the development of shared understandings is more or less an unconscious process on the way towards developing ideas and solutions. We argue that methods need to be used that focus on the process of creating understandings and shared meanings. Such methods require metaphors easily to be created and to be understood. In therapeutic sessions, drawings, family constellations, psycho drama or sculpturing are methods of use. They are, however, mainly individualistic, emotion oriented and time consuming. Furthermore, they depend on manual capabilities of the creator and can therefore create gaps between users dependant on their crafts capabilities. Hence they are not suitable to create an adequate level of discussion. An alternative can be seen in the use of LEGO bricks. They easily fit together, can be released again and provide varieties of functions. At LEGO Serious Play the building of items is only one side of the medal. The items are only metaphors for meaning. The meanings are transported through the story which is told by the creator of the item (Orr 1996; 2006). The meaning can easily be grasped by the other team members, feedback questions can be asked. After the process of expressing the individual meanings, the models can be put together to a shared model – representing the collectively shared object of work or research. Such object may represent the actual status of work reality. It can, however, be developed towards future visions. An alternative approach would be not to create reality but a shared vision. The essence of the method lies in the explication of views through a metaphor created with the help of LEGO bricks. The method is based on the belief that everyone has something unique and valuable to contribute to discussions, decisions and outcomes. People gain understanding and clarity regarding the identity and dynamics of their organization.

We see the contribution of our paper in providing and assessing a building and narrative methodology of how collectively shared understanding and an atmosphere of learning and development is created through the use of LSP. We see the relevance especially in complex innovation, development and change processes. We refer to a case study from an interdisciplinary research community. The case refers to a development strategy which has been brought about through the application of the LEGO Serious Play method.

2. SHARED UNDERSTANDINGS – THE RELEVANCE FOR SUCCESSFUL COOPERATION

Social theories of acting and learning can be seen as analytical models that address how individuals become practitioners in new contexts through growing into that new practice (e.g. Lave/Wenger 1991; Brown/Duguid 1991; 2001). Considering work processes, “growing into a new context” results in a “growing together”. Ideally an exchange of experience between experts is brought about in work communities (e.g. Orr 1996; 2006). Nevertheless, newcomers have to cope with existing structures, rules and power relations in their new work environment. The more experienced a newcomer is, the more challenging he or she may find the confrontation with the new situation compared to his or her former one. This is, however, not a one way process. Especially newcomers that enter outstanding positions, challenge the views and behavior of established members of the organization. Such situations can be found in complex projects, the notion newcomer however does not refer to the novice entering a new organization, but a group of experienced people that form a community and are challenged by an unpredictable new task. Hence a group of “novices” in terms of the task have to “grow together”. Their experience is manifested in understandings, values, convictions and tacit knowledge.

These views that significantly influence behavior can be defined as background assumptions, brought about through practicing. A person within a social system gathers experience through activity, develops ideas about her own work and the surrounding social system. Furthermore, the person adopts the ways of acting, convictions and values of the community where he or she participates. These characteristics represent the historical development of the social system in its environment. In general, the individual is not aware of these background assumptions, although they characterize activity within a community. Argyris and Schön define such background assumptions as “theories in use” (1974; Argyris et al. 1985). Theories in use are brought about by means of cooperation and communication. Since theories in use result from activity, learning and development in social practice, they are shaped through the convictions of the community the individual is a member of. Hence, the background assumptions of an individual represent the collective background of his or her cooperation partners. Argyris and Schön define “theory in use” as a theory of action (ibid). They focus on the aspects of what drives actions within a social community. In contrast to Argyris and Schön, whose “theory in use” can be seen as a mainly individual concept of action, Baitsch stresses the collective aspect of background assumptions which he calls local theories (Baitsch 1993; 1996; Elden 1985). They are collectively shared within a community (Baitsch 1993). The expression “collectively shared” can be interpreted that there is an overlap of understandings and convictions between members of a group but also a distinction. The latter aspect results from the fact that individuals participate at different communities in parallel, which is obvious for project groups whose members originate in different work fields.

Background assumptions are of tacit character. Hence, individuals are not aware of them and therefore they are not easily accessible. Such understandings can be seen as being far reaching while resisting rapid change. Shared values, understandings and convictions hold together communities and can also distinguish from other communities.

Although background assumptions are tacit, informal and members of communities are not aware of them, their effects can be identified in the way people behave or in the development of specific tools and instruments (see also Bourdieu 1990). These explications of background assumptions can be described as “materialization” (Baitsch 1993). Materializations also leave their mark in local theories: People interpret formalities and make use of them in daily work.

Therefore formal rules are unconsciously applied in work practice. Hence, the relation between background assumptions and explicit formalities can be seen as a duality between appropriation and reification.

Argyris and Schön consider this explanatory knowledge as “espoused theory” (e.g. 1978). In contrast to theories in use, espoused theories are explicit and generally accessible. An individual is aware of such theories when using them. Espoused theories can be developed out of practice or its background assumptions through reflection on action. On the other hand, espoused theories become part of theories in use through rule based and reflected practicing. However, one should be aware that theories in use and espoused theories are only partially transferable.

The characteristics of background assumptions can be summarized as follows (Schulz 2008):

- Background assumptions are the driving force of operational practice; however, they may be distinguished in action related theories-in use and more general and stable values and convictions – local theory.
- Local theories are collectively shared within communities; people are normally not aware of them.
- The relation between background assumptions and explicit theories, instruments, knowledge can be seen as a dialectic one. Especially local theories, including far reaching values and convictions, express only indirectly in specific behavior and formal manifestations.

Project work in heterogeneous communities is characterized through collective exchange based on individual backgrounds. Through the exchange and explication of meanings a collectively shared understanding is developed. To some extent such understanding is reified, discussed and reflected. It is a collection of individual opinions that develop further through collective action. Most of the time of the project work, the community is not aware of its shared understanding, which may lead to misunderstanding or diverse assumptions. Hence it is important that the individual understandings are brought about, discussed and connected. The terminology “collectively shared” expresses both diversity and agreement (Baitsch 1993), hence for innovation and learning processes it is not important and even not productive if the opinions, views and values are entirely shared (West/Farr 1992; West 2002). It is rather important that a community is aware of the issues related to diversity and to agreement.

3. DEVELOPMENT OF SHARED UNDERSTANDINGS THROUGH LEGO Serious Play™

3.1 The idea and process of LEGO Serious Play™

LEGO Serious Play™ (LSP) has been developed in the mid 1990s as specific in-company executive education program in the LEGO Company (Roos et al., 2004). At this time LEGO faced with a lot of important challenges, e.g. new toys and video games were entering the market. A new strategy was needed. However, the use of traditional strategy development techniques was very dissatisfactory for Kjeld Kristianson, the owner of LEGO. In collaboration with the two scholars in the field, Johan Roos and Bart Victor who are rooted in strategy making, complex adaptive systems, leadership and organizational behavior, LEGO Serious Play™ has been developed in order to bring out the potential of people involved in strategy building processes. Later, Robert Rasmussen, an internal LEGO expert on how human learns and develop, entered the team. LSP as learning method went to a number of iteration and has been tested and evaluated. LEGO bricks are frequently used for facilitating thinking, communication and problem solving within organizations, teams and individuals. The basic assump-

tion of LSP is that, according to Polanyi's idea of tacit integration (Polanyi 1969), the answers are 'already present in the room' and invites participants to 'think with their hands' to build their understandings¹. Therefore, the method is based on the following beliefs²:

- Leaders don't have all the answers. Their success is depended on hearing all voices in the room.
- People naturally want to contribute, be part of something bigger and take ownership.
- Allowing each member to contribute and speak out results in a more sustainable business.
- All too often, teams work sub optimally leaving knowledge untapped in team members.

The core process of a at least one day LSP learning workshop is based on four essential steps³:

- (1) *Posing the question*: The participants are challenged by a question which should have no obvious or correct solution.
- (2) *Construct*: The participants make sense of what they know and what they can imagine by constructing a model using LEGO bricks and materials. They develop a story covering the meaning in the mode. Through that process they construct new knowledge in their mind.
- (3) *Sharing*: The stories are shared between the participants.
- (4) *Reflect*: As a way of internalizing and grounding the story, reflection upon what was heard or seen in the model, is encouraged.

The process of building something physically with the hands, which is then discussed, can lead to much more insightful discussions. New perspectives can be unlocked if people build something in a creative, reflective process. Each participant constructs an object which represents what she or he think is important about the issue to be discussed. All participants have the opportunity to set their own issue on the table and to explain this in a literally and metaphorically way⁴.

Fundamentally, a LSP learning workshop starts with some building exercises to become familiar with the medium LEGO. Through these tasks participants find out how concrete or metaphorical meanings can be transferred into brick models. The participants are asked to describe their models. Hence the meaning is explicated through the story told. The first section of a LSP workshop is of general nature. After such warming up, the focus moves towards the specific topic of the workshop: Individual models with complex meaning related to the workshop topic are built and each participant shares her or his story. Subsequently all participants will build in a discursive way a collective model out of the individual ones. The shared model includes the individual ones but modified. That means bricks can be added, moved or put together in a new way. Important is that the shared model represents the common understanding about the issue and each participant is able to identify with.

3.2 Developing shared understandings though LSP

LSP is a methodology which encourages a group to share assumptions, ideas and understanding. Reflection, discussion and collective learning within a group are strengthened. Bearing in mind the model of background assumptions described above, LSP provides several principles that facilitate the development and of shared understandings. The first aspect is to share and understand what the members of a project team bear in mind. Through building and explaining abstractions related to a specific topic, personal understandings are expressed. The expli-

¹ http://seriousplaypro.com/docs/LSP_Open_Source_Brochure.pdf, p. 6

² LEGO Serious Play™ Facilitators manual; http://www.rasmussen-and-associates.com/downloads/LSP_License_Prg.pdf.

³ http://seriousplaypro.com/docs/LSP_Open_Source_Brochure.pdf, p. 14.

⁴ *ibid*, p. 8.

cation is multilayered through the brick model and the story behind. Therefore the reification consists of a materialized element – the brick model – and of a volatile one – the story. The meaning provided to the other participants consists of both, and the brick model without story would be subject to various interpretations, like watching paintings and plastics in a museum, at least without clarification. The unique meaning is mediated by the producer of the metaphor through explaining the brick model. Hence the LSP method goes beyond traditional problem solving through storytelling (Orr 1996; 2006), which requires a shared community background, or a shared view on the problem (Lave/Wenger 1991). The LSP method provides exactly this aspect: Growing together (*ibid*) and developing of shared meanings (Baitsch 1992) does not emerge through ongoing participation (Lave/Wenger 1991; Brown/Duguid 1991), but through an active process of expressing and manifesting understanding to the others. The story at least gives meaning, the brick model is a reminder of the metaphor.

As a next step the different understandings and views are put together to a shared brick model, which is discussed and finally provides consensus among participants. Therefore the LSP method integrates the collective and the diverse perspectives. The shared model includes different perspectives, however connected. It is again the non-volatile reification through the brick model that creates a basis for further activity. Hence a materialization exists upon the participants can always come back to at any stage of the ongoing project process. Arguing on the basis of the knowledge epistemology from Polanyi (e.g. 1969), and going even beyond, the collective ‘tacit integration’ of a community is made traceable for its members. The advantage in this process lies in the ability to reflect certain stages of the historical development of such understanding, an aspect considered as essential in activity and practice based theories of change (e.g. Engeström 2008). The alternative to the LSP method is an intensive narrative process (*ibid.*).

The LSP method represents a blueprint for the easy use of “manual knowledge” without the requirement of artistic capabilities; The LEGO bricks can however be replaced by other building blocks. The brick method is also quick to learn and apply alternatives like clay modeling. Furthermore brick models can be modified easily therefore they do not manifest a status quo.

4. CASE STUDY – INTERDISCIPLINARY RESEARCH GROUP

4.1 Case study

Our case study is about an interdisciplinary research group developing methods for enabling process innovations in small to medium sized enterprises. The research group is public funded and lasts for three years (2009/2011). Interdisciplinary means that there are researchers from business studies, organizational behavior, adult education, work research and engineering. Furthermore, there are senior researchers with a doctoral degree and a lot of experience in empirical fieldwork, combined with newcomers that just finished their university degree. Altogether the research group consists of 10 people with very different knowledge, background and experiences work together.

Especially in the beginning of the project work there were no shared understandings about (a) working together as a team and (b) of what is understood by the participants regarding to central issues of the research project like what does innovation and innovation management mean or doing empirical fieldwork with SMEs. Researchers from engineering were more focused on technical issues like designing production process or value stream mapping. Empirical research was understood as applied science in order to help SMEs doing their business. Meanwhile, the researchers from business and organizational behavior were interested in the

behavior of the actors and groups within innovation processes. They understood research as in-depth fieldwork based on qualitative research methods in order to gain deep insights how the social system of the SMEs works. Two different worlds clashed of each other.

To provide a project vision, a three days LEGO Serious Play™ workshop was carried out with the participants of the research group and two external collaboration partners in the project. The workshop was held by an official LEGO Serious Play™ facilitator. The overall goal of the workshop was to grow together as team to develop a shared understanding and project vision, and concrete principles about the future teamwork.

4.2 Research questions and methods

The empirical study was carried out using methods of qualitative social research, such as participatory observation and video analysis. The two authors were part of the LEGO Serious Play™ workshop. The workshop sessions were videotaped and analyzed.

The research questions were:

- What are the individual understandings of teamwork? In which way do they overlap?
- How do the participants model and express their understanding of teamwork with LEGO bricks? Which metaphors are used?
- How do team members react on the models of the other? What questions do they ask?
- How is the process on building a shared model?
- What is the shared understanding of teamwork? Which guiding principles for teamwork can be extracted?
- Which effect does the method LEGO Serious Play™ on the teamwork have?

4.3 Outcomes

In the following section the process of LSP within the research group is described chronological. After a short introduction into LEGO Serious Play™ the participants starts with the so called ‘skills building’ to get warm with LEGO bricks and material. In this phase 1 the use of metaphors and storytelling were trained by building a representation of the nightmare mother in law and a metaphorical representation of “My ideal weekend”. The participants got aware that each model and each story are different and that they can use a wide range of material and metaphors to express something. Personal experiences and understandings become communicable and shareable.

1) Personal identity

The following challenge for each team member was to build a model who, what, and why they are (Fig. 1). The questions that were asked were (a) “Who are you, in particular in the context of this team?”; (b) “What could you bring more of this team?” The intention was to find out, which personal characteristics of each person is currently not relevant for the working process but could be beneficial for the team work. Since the warming up phase generated some experience in model building to the participants the task itself was carried out smoothly and the models were diverse and complex. The models show differences in their characteristics, some are more dynamic, others very concrete, however the shape of the model does not really influence the explanatory power. Hence differences in design can hardly be assessed as differences in quality.



Fig.1: Individual model of a team member

2) *External identity*

External identity relates to how the participants are perceived by others. Names of the team members were handed out randomly and were kept as a secret. Each participant built a model of one of the other team members which complemented that person's model. The models and stories were shared without mentioning who it is for. Finally, after having heard all the stories the models got to hand over to the other team member. The receiver has had to accept the model and to add it on his own model. Through the individual model building without being interrupted and influenced by others, the brick models provide a very personal sight. Once the model is ready and the story is told, the builder gets some distance from his or her model. Hence it showed that rather personal and emotional aspects were outlined in the process in a very factual manner.

3) *Team life*

After getting a shared insight who they are the participants individually built models about team life. Team life is understood as the sense and feel of how people do what they do and how they work together. The challenge was: "Build a model that represents one aspect of team life for you, something that best characterizes and most affects the way teams work". Each team member shared the story of her/his models. The different aspects of team life were explained. The task again led to an increased complexity. However it could be observed that each task to build an individual model more or less stands on its own. Especially in the explanation process the story is hardly connected to preceding ones and the model is rarely reflected from the group in relation to former build models. After the team life models were explained the individual models were placed in relation to each other the story of the team culture has to be developed. All models were put together and the participants had to share a common story about their team. Then the individual models (step 1) were placed in relation to the team life model. Once the participants agree all facets and perspectives of the team members were materialized within the model. Further discussions referred to the model as a whole.

4) *Team connections*

The personal identity models were connected with the team life model to show not only the position of the individual contributions but the actual relationships and networks. A lot of connections were built. The types of connections symbolize the quality of the relationship (Fig.2). They are distant or close, loose or tight, flexible or rigid. Consequently the model mutates to a landscape. The process of building and expressing shared models shows differences to the individual ones. The role of the facilitator becomes more active to support the process and to activate all participants.



Fig.2: Team life model of the research group

5) *Extracting simple guiding principles*

Simple guiding principles were there when the team was constructing the model guiding some decisions. The goal of the last step in the LSP was to make the simple guiding principles concrete. This was done in the same way – they were built. Each participant built one or more principle and wrote down the name of the principle. After that the models were explained and shared by each team member. In a discursive way eight principles were selected as simple guiding principles (Fig. 3; Fig. 4). These were:

- seek all opinions
- take the team with you
- always reach for goals
- Ensure a clear view
- take the perspective of others
- keep the overview
- respect the energy
- no bull fighting, see the work with a sense of humor



Fig.3: Take the team with you

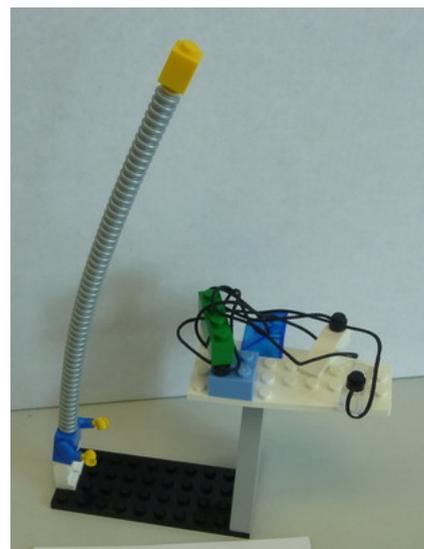


Fig.4: Keep the overview

5. DISCUSSION AND CONCLUSIONS

The case study shows that especially the building of the individual models explicates tacit understandings, values, meanings and theories in use. Especially the combination of the brick model with the story telling provides an added value compared to traditional forms of group meetings. Referring to the prominent story telling methods from Julian Orr (1996; 2006) they require a common ground of understanding within the community which is created through shared (physically or not) activity (see also Lave/Wenger 1991). LSP exactly fills this gap of long term growing together, the only prerequisite of LSP has to be a shared objective (see also Engeström/Blackler 2005). The understanding is generated through the brick model, since all parts of it are named and explained and the story listeners can ask in terms of ambiguities or misunderstandings. The brick building has a further effect on the builder, since he or she does not only build a model but through the physical building the own understanding is reified and reflected – the tacit integration becomes explicit (Polanyi 1969). Hence the brick building and story telling creates awareness. One may argue that the modeling process is too static since the connected bricks are material and manifest. This is only very partially true since the brick model is only the anchor of the metaphor. It is the connection of story and model that provides the meaning. However the brick model provides the opportunity to come back to the metaphor. The LSP can from the learning aspect therefore be seen as a double stimulation (Vygotskij 1978), since the participants ideas develop and express through the interaction with the object to a level which would not have been reachable without the use of the method (see also Dewey 1988/1938).

It is however rather the understanding and theory in use level which is expressed than the value and conviction level. Such aspects come up as side effects of the story told by the participants, however over the process of model building within a LSP workshop they can be visible. A task that refers to the value level are the simple guiding principles where modes of collaboration and communication are expressed.

The expression “collectively shared background assumptions” (Baitsch 1993; Schulz 2008) gets a rather differentiated meaning with reference to LSP. The first step is certainly the expression of personal understandings, the individual awareness of them and the explication to the others. The next step the building of a shared model provides shared understanding, however it integrates the different views, modifies them and puts them together as a whole. The shared LEGO model represents the different angles and perspectives of the participants it is collective and diverse at the same time, however the major benefit lays in the shared object such model represents (Engeström/Blackler 2005). Such diversity based on a common focus provides the basis for innovation and development (West/Farr 1992; West 2002).

It can also be considered as important to follow the dynamic and development process of a whole LSP procedure with metaphor building, individual models, shared model, connecting the individual models. The singular use of just one task in a workshop does hardly lead to a growing together on the basis of a collectively shared object. The dynamics of a LSP process have to be taken into account.

As mentioned above the LSP method represents methodologies that combine physical building with narration. It does not necessarily have to be LEGO, it can also be done by any design medium such as drawing, clay or wood. The LEGO bricks however provide some advantages. Most of the people know them, they can easily be applied independent from crafts capabilities. Further they provide a senseful balance of concretion and abstraction. Principles such as awareness and connectability can easily be realized with LSP. Another advantage is the dis-

connectability of the bricks. Models can be modified and changed. Therefore the models provide some dynamics other shaping techniques do not provide.

Limitations of the methods can be seen in its exclusive focus on the instrument LEGO. It is a certain danger that the object moves away from the original task towards the one “building a LEGO model”. In such case it may be useful to combine LSP with other participative methods. As another weak point we identified the lack of documentation of the process and of the process results. The shared LEGO landscape is on the long run not enough to document the insights of the thoughts that finally led to such model. This goes along with the question how the LEGO model is used in an ongoing project process – the longer the LSP workshop is away, the more static the model becomes, since the narrative part is volatile. On these aspects further research is necessary to build a more comprehensive tool as it is at the moment.

REFERENCES

- Argyris, C. & D. Schön (1978): *Organizational Learning. A Theory of Action*. Reading: Addison-Wesley.
- Argyris, C., Putnam R. & D. McLain Smith (1985). *Action Science. Concepts Methods and Skills for Research and Intervention*. San Francisco: Jossey-Bass.
- Baitsch, C. (1996): Wer lernt denn da? Bemerkungen zum Subjekt des Lernens [Who is learning there? Comments on the subject of learning], in H. Geißler (ed.) *Arbeit, Lernen und Organisation*. Weinheim, Germany: Deutscher Studienverlag. pp. 215–31
- Boland, R. & R.Tenkasi, (1995). Perspective making and perspective taking in communities of knowing. *Organization Science*, 6(4), 350-372.
- Bourdieu, P. (1990). *The Logic of Practice*. Cambridge: Polity Press.
- Brown, J. S. & P. Duguid (1991). *Organizational Learning and Communities of Practice*. *Organizational Science*, 2, 40-57.
- Brown, J. S. & P. Duguid (2001). *The Social Life of Information*. Boston: Harvard Business School Press.
- Ciborra, C. (1996): The Platform Organization: Recombining strategies, structures, and surprises. In: *Organization Science*, Vol. 7, No. 2, pp. 103-118.
- Dewey, John (1988). *Experience and Education*. In J.A. Boydston (ed.). Carbondale: Southern Illinois University Press. (Original 1938).
- Elden, M. (1983). Democratization and participative research in developing local theory. *Journal of Occupational Behaviour*, 4, 1-8.
- Engeström, Y. (2008): *From teams to knots. Activity-theoretical studies of collaboration and learning at work*, New York: Cambridge University Press.
- Engeström, Y. (2005): *Developmental work research: Expanding activity theory in practice*. Berlin: Lehmanns Media.
- Engeström, Y. & F. Blackler (2005): On the life of the object. In: *Organization Science*, 12(3), 307-330.
- Lave, J./Wenger, E. (1991): *Situated learning. Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Orr, J. E. (2006): Ten years of talking about machines. In: *Organization Studies*, 27(12), 1805-1820.
- Orr, J.E. (1996): *Talking about machines: an ethnography of a modern job*. Ithaca, NY: Cornell University Press.
- Polanyi, M. (1969): *Knowing and Being*. London: Routledge.
- Roos, J. & B. Victor (1999): Towards a New Model of Strategy-Making as Serious Play. *European Management Journal*, Vol. 17, No. 4, pp. 348-355.

- Roos, J./Victor, B./Statler, M. (2004): Playing Seriously with Strategy. Long Range Planning, Vol. 37. pp. 549-568.
- Schulz, K.-P. (2005): Learning in complex organizations as practicing and reflecting. A model development and application from a theory of practice perspective, In: Journal of Workplace Learning, Vol. 17, No. 8, pp. 493-507.
- Schulz, K.-P. (2008): Shared knowledge and understandings in organizations – Its development and impact in organizational learning processes. In: Management Learning, Vol. 39, No. 4, pp. 457-473.
- Schulz, K.-P.; Geithner, S. (2010): Between Exchange and Development – Organizational Learning in Schools through Inter-Organizational Networks. The Learning Organization. Vol. 17, No. 1, 2010, pp. 69-85.
- West, M. (2002): Sparkling fountains or stagnant ponds: an integrative model of creativity and innovation implementation in work groups. In: Applied Psychology: An International Review, Vol. 51, pp. 355-424.
- West, M. & J. Farr (1990) Innovation and creativity at work: Psychological and organizational strategies. Chichester: Wiley.