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14. Methods for Developing the Construction Site as a Learning Space

14.1 Introduction

In this chapter I present my *experiences* based on using various Action Research methods for developing the construction site as a learning space. The project was established as a traditional socio-technical project using Thorsrud and Emery's principles (Thorsrud and Emery 1969). In the initial phase of the project, I was inspired by theories of situated or practice learning (Etienne Wenger 1998) as models for the interpretation of learning processes at construction sites. In the middle of the project, I saw the need for more creativity, and more dynamic participation processes. The Future Creating Workshop, which stemmed from a different Action Research tradition (see Chapter 5 by Lise Drewes Nielsen in this book), was introduced as a source of inspiration.

The Future Creating Workshop was introduced as a tool for providing a visionary direction for the experimental design. The project also involved biographical interviews so as to come closer to individualised backgrounds and perspectives of learning in relation to the construction work. These interviews are not discussed in this Chapter, though they contribute to a critical discussion of the theory of practice learning.

14.2 The project set up

The construction industry is a significant business sector in Norway. The construction industry is represented by The Federation of Norwegian

Construction Industries, which consists of fifteen trade associations. The project was carried out at a construction site owned by a major business entrepreneur in the Oslo area. It was organised in close co-operation with the Unions and The Federation of Norwegian Construction Industries. This project had a technical and vocational training profile. Its main choice was that of ascertaining how to develop the construction site into a place of learning.

The project's theoretical framework took Wenger's notion of "communities of practice" (1998) as its starting point. The four components – practice, community, identity and meaning – were used as the basic analytical concepts in the project. In addition, other concepts from a Critical Theory tradition such as "experience" and "subjectivity" became the focus of discussions.

The purpose of the project was to develop a didactical concept for learning at a construction site, based on participation and being operational and understandable for practitioners and connected to their daily work. The project's perspective was oriented toward the subject of construction and production.. It also had a political intention, which was to develop a concept that could create transparency in the building and production process, becoming, thus, an initiative leading to the democratisation of the work process.

The research questions were meant to be relevant for actions and planning at political levels; and it was important to come to an understanding of local conflicts in a project in which there seemed to be a consensus that learning skills and competencies are important for the enterprise as well as the industry as a whole. During the project's experimental phase, the research questions were directed toward the apprentices' learning processes, especially towards the dynamics of the didactical learning space at the construction site.

14.3 Research work: approach and organisation

The construction of buildings is organised such that both the workers and equipment are mobile. The research and development work spanned a period of three years, in contrast to the duration of the construction projects, which were usually completed during one year.

Therefore, the project had to be based at the enterprises' main office and involved the participation of people that were invited to be voluntary collaborators. These people constituted a group that could guarantee the continuity of the project independently of the construction contracts and their duration.

Having the organisation of production in mind, the project was divided into two phases in which the project leader, the carpenters' team leader, the union shop steward and the researcher constituted the core of the development work. The representatives from enterprise and industry – including the unions – became a "temporary reference group". This solution was chosen because the organisation of the construction activities did not allow the establishment and involvement of a larger and more stable group that could exist throughout the entire project. The research area can be described in terms of four levels or fields:

1) The first level is the construction site as an organisation with the apprentices, professional workers and a foreman all of whom who work within the construction site's community of practice

(The following fields have to be understood as the framework for the first and, in fact, the fourth became relatively peripheral.)

2) The second level is the enterprise as an organisation with its leadership and board of directors, shop stewards and association board who represent different standpoints and views, while still having common interests.
3) The third field consists of the industry organisations, the Workers' Association (LO) and the National Association of Construction Industry. These organisations were active during the project discussions and as partners.
4) The fourth field is the societal level, which consists of political decisions, publicity in the media, and situations and events happening nationally and internationally.

Before I discuss the design of the project and its approach, I will briefly present the research process. Figure 1 shows the schematic outline and how it has moved around in the various public sites.

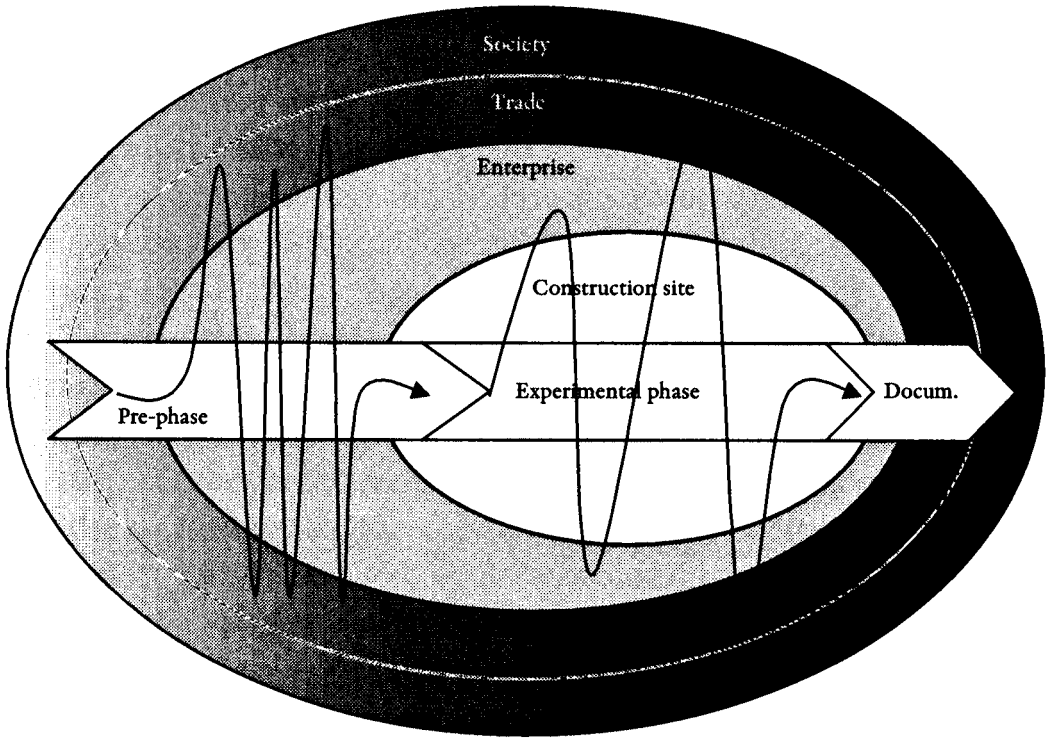

Figure 14.1: Phases and perspectives in the project.

14.3.1 Pre-understanding

The reasons for the project and its legitimacy rest on research reports and articles about the state of affairs in the construction business and site connected to the lack of quality, and a focus on health, the environment and safety.[1] The learning potential that exists in the organisation of the construction site and the work tasks is not utilised. In addition, a series of statements and newspaper articles dealing with the topic demanded action regarding education and training concerning the subject of construction. I refer here first of all to vocational training, and secondly to the further education of skilled construction workers and team leaders.

1 Reports and articles about the problems in the construction branch in Norway were published in various magazines and reports.

14.3.2 *Pre-phase*

The construction activity (enterprise, firm) is organised in a pre-determined way because production takes place where the building is, which requires the mobility of production equipment and personnel. The shop steward and the team leaders of the carpenters (and for training the carpenters) in the enterprise became key actors. The main union official was a watchdog concerned with agreements and principles in relation to the employees' rights and demands. The team leader for the wood workers who later became the project leader was a specialised professional and "pedagogue" in relation to the enterprise's challenges relating to questions about quality and training. The carpenters' team leader also had a wide range of contacts and co-operated with the professional milieu at various construction sites and organisations during the project.[2] The shop steward was the link between the construction workers, internally, and the Workers' Association, externally.

As a researcher, my contribution was based on my pedagogical competencies and experience gained from vocational training and I was, in addition, the facilitator of and source of inspiration in the project. In the pre-phase, the work was aimed at developing a learning concept within which a web application was a central part. The development of the web application consisted of structuring and designing the programme and it took place in the collaboration between the wood workers' representative and myself.

14.3.3 *The experimental phase*

This part of the project was set up as an experiment in which the concept of didactics would be tested and developed further. The experiment took place at a construction site, the workers which were apprentices and professionals. In this group, the latter functioned both as instructors and as a support base. It was during this phase that I proposed to use the "Future Creating Workshop". Before I present the methodological approach of the experimental phase, I will give a comprehensive

2 An example is "Byggforsk" which is a competence centre for the construction branch in Norway. Others are suppliers, upper secondary schools etc.

explanation of the research approach in regard to its values, practical approach and the insights gained during the project.

14.4 Research approach – values and methods

Some basic values such as democracy, transparency, equity, dialogue, freedom and teamwork were the topics of discussions during the research project. In the middle of the project process, I made an attempt to establish a deliberative (emancipatory) design or method: the Future Creating Workshop. The approach implied that the practitioners were considered to be the primary democratic agents in the project – and not only "partners to be listened to". The inspiration came from (Olsén, Steen Nielsen and Aagaard Nielsen, 2003). A consequence of this for the research work was that I had an attitude of "researching with" in contrast to "researching for" or "researching" (see Svensson and Nielsen Chapter 2 in this book). The development of new knowledge happens ideally through interaction, in a wide sense, between the practitioner and the researcher as equally important partners.

The research approach in the pre-phase of the project was inspired by socio-technical theory and the tradition at the Work Research Institute (Arbeidsforskningsinstitut – AFI) which is built on the basis of broad collaborative research that started in the sixties under the leadership of Einar Thorsrud and was connected to new ideas about the organisation of work and the release of human resources (for a more detailed description of the socio-technical tradition at AFI see Morten Levin's contribution in Chapter 7 of this book). The research project focused on the technical aspects of building construction, but it also had the purpose of developing the democratisation of the work organisation. Research and development was thus widely determined by the task of developing a concept of didactics aimed at learning on the construction site, and having roots in the existing and established ways of organising work. The development activities had their roots in the ideas that were developed in the pre-phase and were intended to be tested in an experimental phase. It became increasingly important for me to find methods to deal with the democratic aspect of the project's purpose.

Early in the project's execution phase, I participated in an Action

Research seminar and was inspired by the experiment "Industry and Happiness".[3] This project made use of the Future Creating Workshop to establish a utopian horizon through social imagination. As I understood it, the Danish Action Research project had a good method for strengthening the workers' everyday life experiences and hopes for the future; and it succeeded in utilising the utopian learning processes as a starting point for the democratisation of industrial production (Olsén, Steen Nielsen and Aagaard Nielsen 2003). On the basis of this inspiration, I became aware that my original approach to research had become too "instrumental", and had too few deliberative or emancipatory perspectives.

My reflections about the "AFI model" and "Industry and Happiness" forced me to make a critical revision of the approach to research due to a concern about an instrumentalist bias in my original design: The original project had a detailed plan of how to develop the concept of didactics for vocational training. I began to see a contradiction between a strong focus on the technical aspects of building construction and the subjective or social perspectives. The shop stewards had, of course, the role of ensuring the latter, but they were also able to participate in the technical aspects of learning and competence building.

14.5 Methodology used in the experimental phase

The *Future Creating Workshop* was used as one of various methods for preparing the experiment at the construction site seen as a community of practice. Of course, I also used other kinds of material in the design of the experiment. The early plans for implementing practice learning (based on a theoretical model (Wenger) and on talks (interviews) with key actors and biographical interviews with workers) continued, basically, to structure the design, but it became important to strengthen the democratic element of the design process.

3 "Industry and Happiness" is the name of a Danish Action Research project in the fishing industry. As in my projects, the Danish "Industry and Happiness" project aimed at developing democratic learning processes for qualifying workers in fish processing. In the discussion of Action Research methods that project has been known for the role of utopian processes in learning activities (see also Lise Drewes Nielsen's contribution in this book Chapter 5).

The Future Creating Workshop was chosen to develop a utopian horizon as an attempt to reorganise the collective mental picture of a construction site – to throw away the old and think a new. The Future Creating Workshop as proposed in Jungk and Müllert's model (Jungk and Müllert 1989) was made concrete and adjusted to the experimental phase, i.e. accommodated to the "reality" of the construction site, both in relation to the physical framework such as local conditions, the nature of construction tasks and staff, as well as the culture[4] among construction workers and in the construction industry generally.

The time allotted to a workshop is about five hours. The results transpiring from the Future Creating Workshop established a utopian horizon that is seen and interpreted in relation to the analyses of the other empirical material resulting from the experiment.

All activities were carried out at the construction site in small barracks usually meant for administration and/or as dining rooms. This setting became the framework that had to be taken into consideration in the entire methodological plan. The physical framework provided a constraint due to the lack of adequate space. In addition, there was a lot of noise coming from the construction site and the flow of traffic in and out of the barracks' area.

Although the Future Creating Workshop was not a form of work known to the construction workers, I regard it as successful in the sense that it brought about a moderate utopian horizon and the construction workers clearly enjoyed that way of working. After the workshop was over, it became clear that five hours was a short period for a Future Creating Workshop, but this was the framework we had previously decided upon. However, it ought to be mentioned that various participants expressed that five hours was a very long time to sit still, and they were not used to it. In spite of the given framework, the results obtained in the Future Creating Workshop were of such a quality that it justified including them in research work and the results were able to influence the design of the experiment.

4 After many years as a construction worker, I know the culture at construction sites quite well.

14.6 The experiment

The experimental phase was the period during which the construction workers participated in testing and developing the "unfinished" concept of didactics. As a researcher, I was active in giving guidance about how the concept ought to be practised and taking care of the open ends. The design was unfinished in the sense that the workers were meant to introduce their ideas from the Future Creating Workshop, when the experiment was operationalised.

Although most of the construction workers were informed about the project through written information, meetings and seminars carried out in various fora, they really had no specific knowledge about the use of the concept of didactics in vocational training. Prior to starting the project, the construction workers received some brief information about what the project dealt with and were invited to develop the "unfinished product". In this way, they became (voluntary) participants.

Thus, the first activity in the experimental phase was the Future Creating Workshop.

The themes for the workshop were: how the construction workers could imagine their ideal/optimal work place for learning and personal development, the good work place, and a good place to learn?

The research and developmental research question which lay behind the themes formulated for the Future Creating Workshop was the following:

> The construction site is not fully utilised as a place to learn. How can the construction site be developed to become a learning site?

In the initial phase of the project, there had been a presentation of the entire project and its aim of producing a product in the form of a didactic concept for the construction site. So it became important to integrate the construction workers in a way that they felt themselves independent of the instrumental aims formulated in the first phase of the project. The risk was that they would feel that their ideas had to be loyal to a didactic concept and so not feel free to propose more radical changes in the work organisation and in the established learning communities.

The empirical data shows that the Future Creating Workshop was a suitable approach. They expressed satisfaction with a work form that focussed on possibilities, although they were more used to thinking about limitations. Even though the Future Creating Workshop encouraged them to dream and imagine alternative forms of work organisation, they were still making suggestions with a quite limited utopian horizon.

To visualise what the construction workers regarded as challenges connected to the problem formulated as the theme for the workshop, I quote some of the statements made during the different phases. In the critical phase: *"In general, little time to learn"*, *"Unpredictability in parts of the production"*, *"Production workers do not have the necessary self confidence"*, *"Knowledge is power – Construction workers can learn up to a certain level"*. During the utopian phase they expressed positive ideas about the future. Typical statements were: *"To participate in the project development"*, *"To influence the production"*, *"Possibilities to be able to develop yourself as a professional worker through 'mutual visits' as apprentices"*. These quotations also express the need for influence on work and education as the wish to participate in the development in the site. As a result of the reality phase, a permanent workshop was established with a starting point in the ideas generated in the experimental phase.

This was not a project proposal/draft, but rather a thematic presentation of some ideas and issues for further elaboration. In this (part of the) work, the elements from the utopian phase were used as points of departure for the discussion of themes in the experiment. Here, I wish to refer to two main topics in the experiment:

- To use learning possibilities in construction processes in a more systematic way.
- To create interest for learning among company leaders and others in the industry.

The first topic was related to the workers' own concrete learning possibilities in the construction processes.

The second topic was related to the enterprise and to interest groups in relation to education and learning in the construction industry.

The Future Creating Workshop contributed to workers' feeling of

ownership of the project. The construction workers' satisfaction with their own processes of learning was expressed through their statements about future perspectives. The Future Creating Workshop is a work process that gave a qualitatively good basis for analysis. There was also a feeling of safety among the participants because they were guided through the process and what they expressed was temporarily written on wall charts. The fact that the construction workers formulated realistic goals for the experimental phase seemed to contribute to greater engagement in the final evaluation. They discussed which goals were attained, why they were attained, which goals were not achieved and why this happened. Consequently, the evaluation was carried out consciously and was part of the participants' learning process.

14.7 What was the practical effect of the Future Creating Workshop?

The empirical contribution of the Future Creating Workshop was to provide the framework for the chosen construction site as a community of practice connected to the research question, i.e., how does a construction site function both in organisational terms and socially, and what does it mean for the apprentices' learning? Such questions can be examined in the light of the culture of the construction site and its established practice within which the formal hierarchy and the autonomous work groups/teams are known factors. The question was: What meaning does the organisation of the construction site – community of practice partnership and social quality – have for the apprentices' learning? The focus was aimed especially at the apprentices' learning. In addition, a comprehensive analysis of the collective learning at the construction site was also carried out.

The research approach contributed to the articulation of the construction workers' experiences at their work place. The empirical material collected in the Future Creating Workshop provided the basis for understanding other empirical results derived from the experiment, for example, the participants in the Future Creating Workshop were critical of certain aspects of the practice at the construction site, and were, thus, conscious of what it consisted of. However, the empirical mate-

rial gathered on a day-to-day basis during the experiment showed that they practised the routines and rules that they criticised. These types of contrast and paradoxes were examined and discussed in relation to the theoretical sources of this research. In addition, the empirical material contributed to strengthening the links related to learning, reported in a series of studies carried out in the construction industry (Bjørnåvold 1992, 1993, Andersen 2001, Frøyland 2004).

14.8 The Project's results

In order to provide a short description of the project's empirical results, the project has been divided into a pre-phase and an experimental phase.

The empirical results from the pre-phase show how an Action Research project can be loaded with and reveal conflicts when the established practices and ways of thinking are challenged. This was especially the case at the level of the enterprise. It became clear from rhetoric and the documents circulating in the enterprise that several problems related to the positions of specific people and professional groups arose. The project appeared to be threatening because it could create transparency in relation to management dispositions and give the construction workers access to knowledge. It could, thus, disturb/upset the organisation's power relations. This problem was also expressed in the Future Creating Workshop, when the construction workers expressed that they could be educated up to a "certain" level. The processes also showed that the project was vulnerable, although it was well anchored in the enterprise's leadership and the shop steward. The project was stretched over a period during which, among other things, there was a replacement in the enterprise's leadership causing serious problems for carrying out the project. The conflict between the long-term thinking in the construction industry and in unions and the short-term view connected to the daily production demands of an enterprise also became very apparent.

The empirical contribution resulting from the experimental phase is especially related to the apprentices' learning within the framework of a construction site and to the dynamics in the community of practice. The construction workers were conscious that the established practice

and the organisation of work were not satisfactory. Still, their mental picture of a construction site was so solid that they had difficulties in establishing a new practice, even though this practice had been prepared/arranged for the experiment. They tried, but went back to the "old way". A statement during the final evaluation connected to planning and predictability in the building process confirms the problems associated with this attitude: *"Here we have had the opportunity, but we have in a certain way misused it ... or we have forgotten it"*. Although the lack of planning resulted in a series of conflicts, there was a consensus that there had been many good discussions about the professional aspects of construction.

The empirical data shows that it was a challenge for the community of practice to arrange comprehensive and interrelated activities that were perceived as being meaningful by the apprentices and as a point of departure for their learning. Within this picture, it became decisive that drawings and plans created a frame of reference for the change in practices.

Quality in the social community and the actors' competence (in a wide sense) becomes, thus, an essential factor for the apprentices' learning. The establishment of an inclusive community/partnership seems to be a great challenge.

The challenges are, first of all, connected to the quality of the community. However, it is also important to stimulate the ability and wish to organise a practice in which there is place for a collective preparation/cultivation of experiences. Such elements are necessary to facilitate a societal dimension in a learning organisation.

Newly published reports about the construction industry state the need for both collective and individual learning at the work site. It is also stated that learning across the construction sites and projects are quite significant for the industry (Andersen 2004, Blomli et al. 2004, Frøyland et al. 2004).

14.9 The project's contribution to the theory of learning through practice

This project developed a concept for learning at the construction site as a result of empirical work. It was called the LAV-concept (LAV: Laering, Arbeid og Verdiskapning/English: Learning, Work and Value creation). The creation of the LAV-concept is a result of a dialogue with various actors at different "levels" in the construction industry.

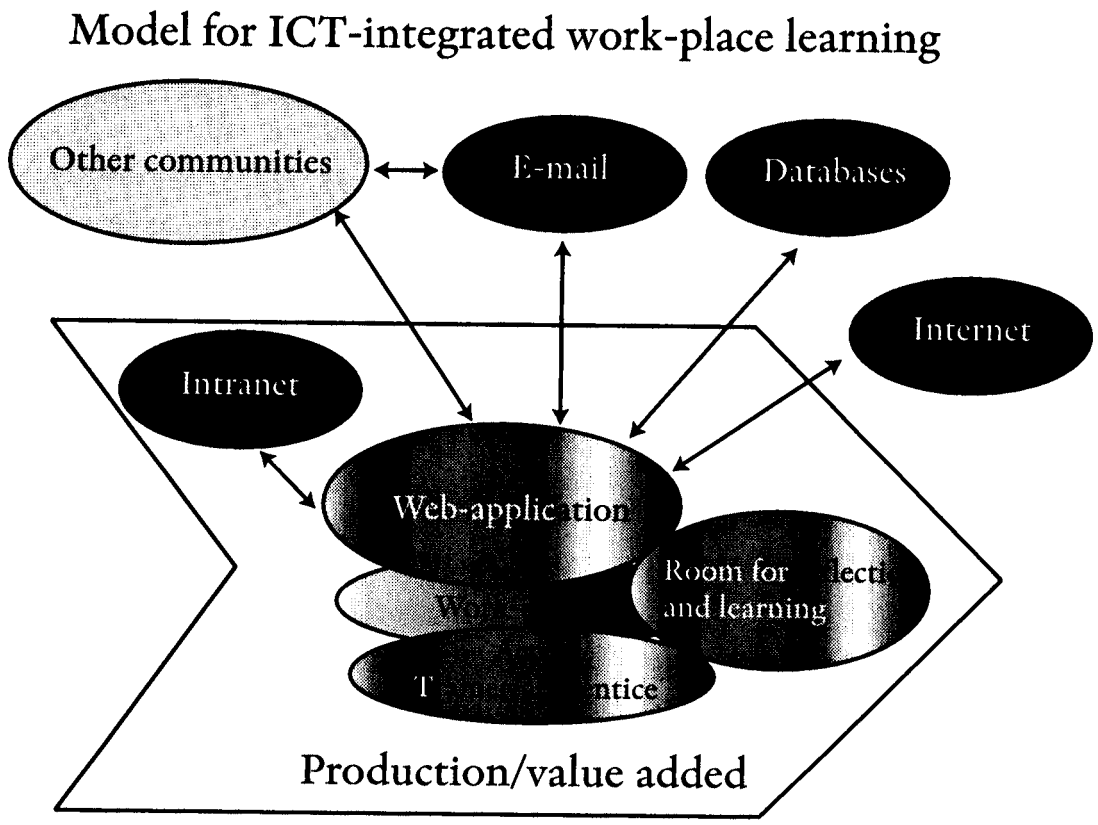

Figure 14.3 LAV-concept

The didactic concept "LAV" – learning – work – value creation is based on the following principles:

- Learning must be individually based (individual learning plan).
- Learning must be applicable/useful and of current interest – both for the vocation and in general.

- Learning must focus on the quality of processes, and products.
- Learning must have a societal perspective.
- It must focus on learning in day-to-day work.

The concept of value creation provides a wide definition within which learning is regarded as adding to the individual's competence, to the enterprise's and to society's.

Figure 3 provides a schematic presentation of the LAV-concept, which is characterised in terms of the following main components: 1) It is connected to value creation and production; 2) It creates interaction between work tasks – actors – and resources available through Internet; 3) It encourages reflection and learning; 4) It increases the possibility to maximise learning beyond the community of practice through a web application and the Internet.

The question then is how the didactic concept can be developed to advance learning possibilities in an industry that, in the best case, offers varied and meaningful work tasks and challenges, and in the worst case contributes to stress, troubles/difficulties and exclusion from active work (Frøyland et al. 2004). There will also be questions about whether this concept, when applied in a context of a new division of labour between the enterprises, will still contribute to learning and the development of competencies at the construction site? The project as a whole revealed that the potential for good solutions often become impossible because of too much stress and insufficient time to follow up on good ideas at the site level.

Etienne Wenger's concept of "communities of practice" now enters the discussion. The process of meaning negotiation can be regarded as both the choose part of Wenger's theory of social learning, as well as the problem within the theory. It appears that Wenger's concept of communities of practice is insufficiently contextualised to become a model for a new didactic concept. Although he refers to participation in various communities of practice, the concept does not ensure a solid elaboration and mediation of experiences. My empirical work shows that this is a problem.

My empirical material also shows that the apprentices' membership in the community was not worth mentioning. It appears that they did not identify themselves with the community, but experienced what it

was like to have the status of an office boy. Consequently, they did not have the opportunity to show and use their competencies as much as they wished.

14.10 The project's contribution to the discussion of the researcher's role and combinations of various methods in Action Research

In the project, I have practised a variety of methods these included biographical interviews, the socio-technical facilitation of cooperation and conducting a Future Creating Workshop aimed at the development of a utopian horizon for the work organisation. Before I started the project, I did not realise the complexity of those different roles in the project when they have to be incorporated in one person. The problems of the different roles were linked to the tension between being a researcher who collects empirical material, and being an innovator "teaching" the participators and facilitating ideas. Another problem was that of elaborating statements and research questions together with the construction workers and other participants. Furthermore, I became very close, socially, to most of them, so I sometimes had problems with creating the distance necessary for maintaining a critical view of what was going on.

In spite of the difficulties, I have seen the importance of combining different methods. For example, I am sure that the introduction of the Future Creating Workshop was useful for gaining more and deeper knowledge about possibilities and conflicts in practice learning; but that on the other hand it did not result in practical constructive and consensual reform. So you have to face a kind of contradiction in choosing methods for Action Research, what is most important, a successful change arrived at in small steps, or the achievement of a deeper and more knowledge seeking strategy which includes enlightenment about conflicts in the creation of practice learning with a democratic orientation.

In my project, I also tried to use biographical interviews. The interviews made it possible for me to strengthen the individual dimensions in the development of practice learning, which was important in the

construction of the LAV-concept. But I hardly succeeded in bringing the individual dimension into the collective discussion among workers/apprentices, and so I did not succeed in attaining the principle of "research with".

14.11 Conclusion

The Action Research approach seems to have revealed a sequence of relations that are not necessarily clear when using other approaches. There are various studies that have asked leaders of enterprises about their views regarding learning and the development of competencies. Almost without exception, they look at them as the most important things for an enterprise in order to be competitive, and to be an attractive workplace. This was also the opinion of leaders in the enterprise where this project was carried out. However, when the project's activities became concrete, a series of conflicts of interests and positioning arose in relation to the project's content and organisation. People in leadership positions, who had initiated the project, tried to leave the project later on.

This Action Research project is based on Kurt Lewin's triangle in which interested participants, learning/training and the researching reflections are the three main elements (Olsén, Steen Nielsen and Aagaard Nielsen 2003). During the execution of the project, the research approach was enriched by ideas borrowed from Critical Theory, which were brought together with the interactive approach of the socio-technical tradition. Values that provide democracy, openness, equity, and the view about the practitioner and researcher being equally valuable partners are fundamental for the whole research project. Although this is the ideal situation, there were of course several situations in which, for example, the "power free" dialogue did not happen at all, or in which structured Action Research methods were invisible.

The project contributed to illuminating several aspects related to learning through practice. It appears that construction site culture is part of construction workers' backbones, and that this can be an obstacle to the further development of the construction site as a place for learning. Another insight is that the lack of time for experimenting and learning

can have the same implications. The practice used in the construction site is to a large degree involves both individual and collective learning. The focus is mostly on the technical/professional side leaving little space for the societal perspective. The construction site's community of practice leaves little room for a collective elaboration and mediation of experiences. The apprentices perceived their real participation and influence in the community as being quite limited.

Even in a project that was planned to investigate what was observable at the construction site and about the cultivation of experiences instead of the technical aspects, there were several impediments to establishing links between the construction site and daily life. These challenges became more visible when one of the apprentices was asked about the connections between work and daily life and he could not make this connection. This was an indication that work experiences and the daily life run on parallel tracks, and to a very limited degree confront and enrich each other (Salling Olesen 2000). That apprentice's entire communicative situation in the project was linked to the work place and his statements were therefore associated within this context. This is a confirmation of the problems described by Salling Olesen regarding how experiences of life experience from outside working life are only to a very small degree connected to experiences gained during the working life.

Within the previously mentioned LAV-concept, it is possible to discuss the problems presented in order to develop the construction site as a learning place further. It appears that the challenges will mainly be connected to the organisation of work that allows the workers to participate and have an influence on the whole process, from planning and execution through to the evaluation and quality assurance of the work performed. The "learning space" proposed by the LAV-concept challenges the collective cultivation of experiences within which the societal perspective must also occupy a space.

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