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Employee participation and learning, a strategy for changes - "experiments" as tools in the change process

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Abstract: *The purpose of this paper is to show and discuss possibilities and problems concerning changes using a participatory strategy and with a good working environment in focus. The processing industry is chosen as example. The case study shows that organizational changes can be rather problematic. The beginning of the change process where all actors are assumed to use all their potentials in developing their future organization is described. The different employee groups need to learn to participate. An important point is to use the change process to establish a learning culture. Experiments based on reflective learning in an "experimentarium" as support for the change process, and the positive results obtained are discussed.*

INTRODUCTION

The initiating thesis for this paper is:

* Changes which take working environmental aspects (note 1) into consideration create the need for participation of all actors in all phases of the process (system designers, managers, employees) in relation to technical as well as organizational issues.
* If the process of change is democratic and all actors participate with their knowledge and experience, and a common learning process is established, it will create better possibilities for development both for the employees and in the company.
* The different actors need knowledge and methods for participation. Learning based on and centred around active participation in experiments and reflections related to the learning can support the participative change process. This learning can be planned and carried out away from the daily working situation e.g. in the form of role plays, a simulation of new situations or developmental scenarios

We do see a great potential for development of methods to assist technological and organizational changes based on the above mentioned thesis.

Our research project is concerning the process industry and in particular the work in control rooms and monitoring work. The processing industry is a well documented area, because it has been the focus of a lot of research, and development projects reporting both the technical development and the ergonomics of monitoring work in the control room. However, the utilization of existing knowledge regarding this is far from what could be achieved. For instance there are problems with the psychological working environment, and the organization of work is quite traditional.(Bergman 1995)

We see a challenge in trying to match the new technical possibilities with new organizational structures to improve the working environment for monitoring jobs.

An important question is how these new structures can be developed and established, in a way that improve the working conditions for the employees. At the same time we want to create better opportunities for learning and competence development. This development is necessary for the employees who have to be active participants in the continuous technological and organizational renewal processes of the future.

Within industries with a high degree of automation, like the processing industry and related industries, there is a need for readiness, knowledge and awareness when technical or organizational changes are on the agenda. There may be many reasons for changes, e.g. promoting efficiency, renewal of the automation systems, rearrangement of the production etc. No matter what the reasons for the changes are, it is important to have the above mentioned aspects in mind so all employees and managers are equipped for continuos changes.

THE CASE STUDY

In November last year we started a study of a major change process. A Danish processing industry with a large turn-over has to improve its efficiency in all areas, e.g. a reduction of the number of employees from 200 to 150 - 170 before the end of this century.

In 1995 the company changed its automation system from an old hydraulic system with mimic boards and a lot of manual control to a total new computer based electric system with monitors and a lot of automatic control loops.

The system is now running smoothly, but it took about two years before the operators were familiar with the new technology. The new system has increased the work load in the control room, because a lot of monitoring tasks which before were done manually in the processing plant now have been relocated to the control room. Especially the mental work has increased and thereby the stress level.
In the same period new processes have been added to the plant, and old ones have been renewed, and due to this there is still a great need for monitoring and maintenance work at the plant (outside the control room). The company uses job rotation between the different tasks and have not yet changed the number of persons on each shift as a consequence of the change in technology.
Except for minor technical changes, and implementation of the automation system, the company has not changed very much within the last 30 years, and it is the assumption that there is potentials in an organizational change which could make the company more profitable and at the same time bring a necessary renewal into the company.

Handling the change process

The administrative director is inspired from the ideas in Business Process Reengineering (BPR), and wants to run the change process with "open doors", and all employees are invited to participate as much as possible. The administrative director really wants the process to be exemplary and democratic. The working environment both during and after the change process is very much on the agenda, and the management have promised that no one will be sacked, because the reduction of the workforce will take place by people leaving because of age.
An international consulting company (note 2) is hired to supervise the change process and their message was that they could handle a change process with no frustrations.

The approach of the consultants was to activate as many employees as possible in the process. To facilitate and produce an "as is" picture of the actual company situation together with the employees, and furthermore to create a "to be" situation. This approach takes a lot of resources (time, motivation and involvement), which of course will influence the daily work situation. Everybody is very busy either with the change project or with the daily work tasks, and the consequence is that the extra work load with the change project is accused of being the reason for all problems.

The first phase of the change project

The objective of the change was efficiency, better profitability and reduction of the number of employees, and at the same time a much-needed renewal of the organization. The BPR-process should be with a high degree of employee involvement. Using their experience and knowledge, the employees should contribute to design their future work. With input from employees and managers on all levels, the consultants should guide and facilitate the process.
The first step was an analysis and a description of the actual company situation and a discussion of possible means to reach the goal. In this phase there was a rather optimistic atmosphere - many could see some interesting perspectives for their future work situation. But the talk about the reduction of the staff took a lot of attention, especially among the operators. They started to talk about, with how many operators they (the consultants and the management) would reduce a shift.
The consultants' approach was from the very beginning to activate as many in the company as possible. In the next step, where the analyses of possibilities for changes should be completed, they formed a main working group with representatives from consultants, employees and managers. This group should be relieved from their daily tasks and do nothing but work with the change process. The consultants trained this group to facilitate and analyze input from their colleagues. The group could set up ad hoc groups or workshops in which they made so called "posters".
A poster is a big piece of paper on which a group can make an illustration or model in large scale of, e.g. a work process. Different actors in a workshop can contribute to create a poster. It could for instance be a group of operators who had to make a poster about the monitoring process. When making a poster the participants in the group at the same time can tell what is good and what is problematic with a specific task. Members from the main group finished the poster. The final step is to discuss the process shown on the poster. For this purpose all operators are invited to a presentation of the poster, held by one of their colleagues from the main group. After the presentation the operators can comment the results.
At first when the posters were quite simple and illustrated the actual situation, a number of comments came up. In the following sessions the posters became more complex and the operators did not understand them, and the time spent for presentations was too short to make them understand the posters. Furthermore a lot of rumors started among the operators: About the numbers of manning, the lack of security, the managements' hidden agenda etc.
This situation among the operators is now that there is no trust in the consultants or the management, nobody can see the advantage from giving input to the process, and there is no motivation to participate in the change process. The change process is more or less owned by the main group and the consultants. They have developed

their own language ("a change slang"), which in a way has worked for the main group it self, but at the same time widened the gap between the group and the rest of the organization. The main group now has to show all the motivation. They now own the process and the rest of the employees do not feel any responsibility towards the result..

The temperature of the working environment is decreasing, because the process has driven the operators to consider the company culture, their working environment and their possible future work conditions in a new way. They have been discussing different issues as: the mental work load in the control room, what is job satisfaction, what does a safe work situation mean etc. The discussions are highly influenced by uncertainties connected to the change situation. In a way the operators express during their frustration that they need a much deeper discussion of possibilities and concerns in connection with the actual change process. They really need an understanding of the frames in which they can see their own possibilities and future work. It is difficult to discuss if you don't know the premises. They also need somebody to facilitate a constructive discussion so it is going to be proactive and not reactive. A good sparring partner could be a help for the operators so they in an analytic and constructive way might be able to put up suggestions for their future work situation. They have to take the overall goal for the change in consideration, but the working environment as described in "The Developmental Work" (note 3) could be the starting point for a proactive discussion.

As a suitable sparring partners to the various groups of employees it would be natural to think of the members of the company's cooperation committee as this group of persons represents all the various groups of employees and further due to the nature of the committee should be well informed about the company's thoughts about the future as well as about the current change process. This has not worked out, and we discovered that the reason was that the cooperation committee members did not feel that they were equipped to discuss the change process. At the same time the cooperation committee also had realized that they did not have the necessary knowledge to participate as a cooperation committee in a change process. They needed knowledge about their role. But they had a wish to assist their colleagues as well as the management in this difficult change process. They felt they were moving away from the change process.

So now was the time for us to intervene and try to improve the working environment and suppress the frustrations. We decided to start en intervention with the cooperation committee. Firstly because they could be the key to open the process for their colleagues, secondly to help the cooperation committee to get "closer" to the change process. Our idea of such an intervention is based on experiments with learning, and facilitated reflections in an "experimentarium".

EXPERIMENTS IN AN "EXPERIMENTARIUM"

We consider learning and change processes to be very connected (Busk Kofoed et. al., 1997). Therefore, to support change activities, e.g. get the background to participate in a change process, we want to establish a framework for learning and development. This framework should offer possibilities for employees from all levels and functions of the company to participate in a common learning and development process, where they can benefit from each others' resources and create a common basis for the company's further development.

It is our opinion that such a framework can be made by establishing an experimentarium.

The ideas in the experimentarium are based on action learning (see the next subsection), and it is established in a ' room' which is removed from the daily life of the organization. It is a room for experiments which can be made without any direct influence on the production or the product.

The purpose of the experimentarium is to give employees, managers and developers/consultants by themselves or in mixed groups the opportunity to develop, to test new ideas, and to carry out experiments in an experimental situation. In practice the experimentarium can be placed in a concrete room; but the specific arrangement is dependent of the experiments going on, e.g. training and development by distance learning. The experimentarium has to be seen/understood more like a virtual room for different activities, where the specific activities ' furnish' the room.

It should be possible to make experiments without arranging a full scale copy of the concrete work place, e.g. when trying new ways of cooperation and team work, or showing the consequences when delegating responsibility and authority.

During working with specific activities the participants are taught to see themselves and their colleagues as experts within their fields, and they also experience a common learning process. This is important to open the eyes of the different employee groups for each others resources so they can take part in a common development process - a process in which everybody in an interdisciplinary cooperation can contribute with expertise to solve problems or to create innovation. A broader understanding and knowledge of other employees' /colleagues'work may cause mutual respect, strengthen the confidence in own resources, and improve cooperation opportunities (Busk Kofoed, 1994).

Different activities from both working processes and learning methods can be dealt with in the experimentarium. The learning process is necessary to connect and support the different activities which have to

be worked on in the experimentarium. We have to develop the optimum conditions for learning: create security, confidence, and motivation. Pedagogically we find some of the main focuses will be to establish a high degree of active participation in all phases of running the experimentarium, to ensure and facilitate reflections, and to make the learning process visible.

The learning processes

Our basic approach to learning is that learning is problem- based and that learning is based on learning in groups during a process, where reflection loops have a predominant place. Our understanding of learning processes is based on Kolb's cycle which describes experimental learning as learning taking place in a cycle with four key points: - doing - reflecting - thinking - deciding - (Kolb, 1984). Based on this and Schön's (1987) ideas about reflection in the learning process John Cowan (1996) has developed a learning method concept based on several small reflection loops - Kolb cycles (as paraphrased by Cowan: - experience - reflection - generalisation - test -) and planned reflection three times in a learning process, see fig. 1: before (*for*) or in the very beginning of the learning process where it is considered what the process shall be to fulfill the learning needs, *in* the middle of the process, where it is considered how the process so far has fulfilled the scopes and aims, whether they are still relevant and what changes in plans if any are necessary, and finally after (*on*) the learning process or rather as the end of the process a reflection loop is made in order to decide what has been accomplished and what is still missing. In this third reflection loop it is considered how the experience can be used in the future in the daily work situation as well as in future learning processes.

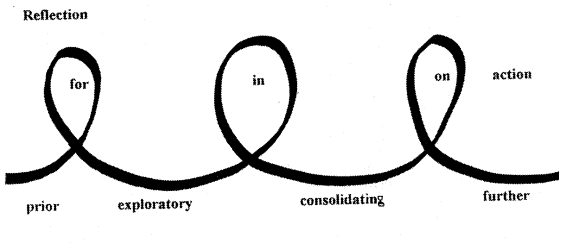

Fig. 1: The Cowan diagram. (Cowan, 1996).

One of the main purposes using this approach with three reflection loops is to teach the participants to learn and improve the quality, depth and relevance of what has been learned.

Results from the experiments

We have made 4 experiments in the experimentarium:

1. Two about cooperation committee work
2. Two about sampling and quality of samples

Experimentarium 1

The experimentarium with the cooperation committee was planned to pas the three reflection loops of the Cowan diagram (fig. 1).

We had two days, each of five hour's incl. lunch and coffee breaks to run the experimentarium, and the plan was to make the participants learn how to analyse a specific topic and make a conclusion of the analysis in order to suggest some further action on the topic. The work consists of the following phases:

Start:

* selection of a subject to be analysed (there were three subjects to choose among, all suggested by the cooperation committee)
* a brain storm on the subject
* organising/categorising the results of the brain storm in topics/themes

Analysing method:

* selection of some of the topics/themes to be analyzed
* selection of angles to approach the analysis
* doing the analysis
* conclusion
* suggest further action

The first five "dots" were planned for day one and the last three for day two.

Major points of the experiment

The participants in the experimentarium should work in small groups (3-6 persons) with the analyses because this should supply the process of the experiment with some extra major points:

* the participants will learn together
* everybody will be heard
* mutual inspiration will have a synergic effect

Reflection loops

Before the actual start we did a short reflection *for* action loop where we tried to match our intentions with the experimentarium to the participants expectations.

At the end of day one the group prepared a short seminar, where they presented the status of the work so far to an "external" opponent. The role of the opponent was to place some provoking questions (facilitating questions) about why, how, who, when etc. These questions should facilitate the reflection *in* action loop and we started day two by questioning the results of the reflections with the question: "Where are we now?".

The experimentarium ended with a final seminar where

both the result of the work (suggestions for further action) and the processes of reaching it were reflected (reflection *on* action). At this seminar the opponent was also present.

Results from experimentarium 1

Experimentarium 1 has been run twice. Both of them with 3-4 persons, and both time the participants succeeded in making an analysis of the chosen subject, for some relevant topics. They also made some well argued conclusions and suggestions for further action. So considering the direct result/product of the exercise, the participants have learned to make fast and powerful analyses of specific topics with a little help from the coaches.

As to the ' extra major points' to be learned during the process of the experiment, this part was even more of a success. The following list of experiences/results/skill's is more or less expressed directly by the participants in an evaluation of both experiments, 1-2 weeks after the experiments took place.

The participants expressed that they had:

* seen that they together possessed a large amount of knowledge
* experienced that their individual differences were a strength
* learned to see each other as experts on different fields
* observed that a holistic view of a topic resulted in a better analysis
* experienced some cognitive jumps
* seen that one has to analyze and assess consequences before implementing

Experimentarium 2

The second "experimentarium" was carried out because the company had experienced problems with the samples used for Quality Analysis (QA), and the employees had expressed a wish to learn how to draw samples correctly. It was agreed to make a course in sampling techniques and sampling equipment. Planning of the course should not start before the company culture and the employees´ attitude towards the management and the company as such was discovered, so the process started by interviewing the participants in order to get the feeling of the culture. Additionally the interview was used to initiate a reflection loop before the actual process. Through this reflection loop the participants were forced to express their opinion and feelings related to their particular daily tasks, and thus forced to clarify for themselves which were their governing values and which were their actual needs for learning.

The participants had different backgrounds and different jobs. Some had only 7 years in public schools, 3 were lab technicians, and one was head stores-clerk and had a background as highly skilled technician.

They all had rather negative experiences with their managers' will and ability to make changes and they were, even though they had expressed the need for learning more, rather disillusioned with regard to participate in courses.

On this basis and after discussions with the head of QA it was decided to run 2 parallel courses with 7-8 participants. Each course should have 4 sessions, one session a week in 4 consecutive weeks.

The themes of the courses were:

- Sampling and the QA-system, about the documentation in the QA system covering sampling, and about the importance of employees' active participation in keeping the QA system active and "fit".
- Sampling equipment and sampling techniques with an evaluation of the techniques and equipment currently used.
- Health and safety in general and in particular in relation to sampling.
- Correct sampling exercise based on the 3 first sessions. The participants in pairs were asked to plan and perform an actual sampling.

Because of the participants´ backgrounds it was decided only to give a very brief presentation of the subject to be worked with in the sessions, and then let the participants take the role as consultants to the management. Through this process brainstorming, categorization and problem analysis were applied as tools.

Reflection.

In the very beginning of the first session the participants received a short presentation of the theory about experiential learning and about the pedagogical method based on reflection.

They were then asked individually to consider how they would contribute to make the course a success and what their success criteria were. The result was presented in plenum.

The next reflection loop was made as the last item in session 3. Here the participants were asked to reflect on what they had accomplished so far - was it what they expected - and should the last session be changed in order to achieve the goals set up in the first session?

The 3 rd reflection - *reflection on* was made as a course evaluation with the questions: "did I learn what I wanted?", "can I work better and accomplish more on the next course, I am going to participate in?", and "what have I learned from this course and how do we make use of it in our daily work?".

Results from experimentarium 2

Through the final evaluation reflections of the

participants from both groups showed:

- that the participants had got a higher opinion of their own skills.
- a higher recognition of other personnel-groups´ work and expertise
- that it is a good idea to solve problems in a joint team with persons of different background as the multi disciplinary approach gives better solutions.
- that learning through active experience and reflection was experienced as interesting and effective
- that they had learned a lot about sampling

PERSPECTIVES

If our experiments are to succeed, using rather short time, there are some conditions which have to be fulfilled before the start:

- we as facilitators and planners will need a thorough knowledge and understanding of the company culture and governing values
  the participants must have confidence to each other and to us so that they feel safe
- the company must provide the time to participate
- the participants should be enthusiastic
- the participants must accept that they will have to contribute a lot to the process and that they must make reflections before, in and after the process in order to get the full benefit of their efforts and participation.

Concern's about the experimentarium

In some cases where the time in the experimentarium is very limited it may be very difficult to accomplish to pass three full reflection loops. In such cases one should only plan for the most relevant reflection loop. In such cases it would be an advantage if the participants have tried to pass all three loops in an earlier learning process.

A second concern is to establish the evaluation in due time, so close to the experiment that the participants still remember what happened, and at the same time at a certain distance, so that they have the possibility to reflect upon the activities.

Another concern is whether it is possible to transform the results from the experimentarium to daily practice. In order to make this possible it is important that the management gives the "space" to carry out and supports the implementation. In not doing so there will be a major risk to end up with employees even more frustrated than before the experimentarium.

Possibilities with the experimentarium

Having succeeded the two experiments, we see a great potential in the ideas of using the experimentarium to establish common learning processes, which can help companies during organizational changes towards a learning organization.

What has to be done in such a situation is to find a way to remove the focus from all the negative aspects in changes towards the potentials in learning and developmental situations, and in the new jobs, but of course still be aware of the problems. We think that one way to accept changes and discover potentials/possibilities could be to participate in experiments, where the subject to be analyzed are the new working conditions. It will take several experiments to create acceptance of changes which involve changes of values and culture.

An example of an experimentarium could be made to let groups of operators develop and assess different possible work situations and for instance examine some of the major problems they see through a simulation play.

It is our belief that this kind of experimentarium activities can overcome a lot of the actual frustration, and improve the working environment, not only at present but also in the future, because the actors involved can combine their knowledge to develop better working tasks, and at the same time obtain mutual respect.

The challenge for the management is to see participation and learning as a strategy in the change process, and to implement methods which can support actual and future changes.

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Notes

1. The definition of working environment is both physical and socio-psychological aspects of the work situation.
2. We have been invited to study the process. We are also allowed to advise both the consultants, the employees and the management and we are able to interfere in the change process and develop as well as test or examine new ideas
3. Definition of "The Developmental Work". The Developmental Work is a production concept introduced by the Swedish Metal Workers' Union in the mid 1980' s. It describes a new strategy for the trade unions focusing on what they see as current possibilities of establishing consensus between the workers and the employers on development of work, flexibility, quality, qualifications etc. - possibilities related to the new market conditions. Job enrichment and highly skilled workers to secure flexibility, involvement of employees in decision making and planning of work to increase motivation and quality, and employee influence on product and services are some of the potentials outlined 1. During the past 10 years the unions and the working environment experts have been increasingly engaged in the concept.