SUPERVISION AND GROUP DYNAMICS

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Abstract: An important aspect of the problem-based and project-organised study at Aalborg University is the supervision of the project groups. At the basic education (first year), it is stated in the curriculum that part of the supervisors' job is to deal with group dynamics. This is due to the experience that many students are having difficulties with practical issues such as collaboration, communication, and project management. Most supervisors ignore this demand, because either they do not find it important or they find it frustrating, because they do not know, how to supervise group dynamics. This problem is not only found at Aalborg University but also at the engineering colleges in Denmark. For that reason a course was developed with the aim of addressing the problem and showing, how it can be dealt with. So far, the course has been offered several times to supervisors at the engineering colleges as well as at Aalborg University. The first visible result has been participating supervisors telling us that the course has inspired them to try supervising group dynamics in the future. This paper will explore some aspects of supervising group dynamics as well as, how to develop the Aalborg model in terms of staff development.

1. INTRODUCTION

The authors have been part of the Aalborg experiment for many years starting as students more than twenty years ago and later on working as teachers and supervisors but also doing research in the area of, how the students learn to be competent team workers. The research was mainly carried out as action research, as we at the same time were engaged in developing the problem-based and project-organised study by experimenting with our own practice. Over the last six years, we have also been part of a group of teachers, who has agreed to do experiments together and afterwards share experiences. One experiment was to focus more on group dynamics, when supervising. We believe that a study model such as the Aalborg experiment is dynamic, always changing through a process of continuous experimentations and reflections. Through our own experiments, we have developed what can be regarded as a toolbox containing different practical ways of supervising group dynamics.

1.1. Students need more from their supervisor than a technical consultant

From our own practice, we know that students working in groups often find it difficult to collaborate and to benefit from being a team. Typical problems, which they are facing, are:

- They have different ambitions and different ideas about, where to focus in the project that they do together.
- They have none or very little experience in project management.
- They do not know how to handle a conflict between group members.
- They are not used to motivate themselves to learn.
- Often they do not know how to handle a meeting in an efficient way.

It seems obvious that they need teambuilding. This is documented by (Algreen et. al. 1995) and (Kolmos 1999). It has also been documented that, the group will develop as more reflective and concerned with that aspect when the supervisor address group dynamics (Hansen 2000) and (Langeland 2000).

At the first year of the engineering education in Aalborg, the groups have two supervisors. The main supervisor is typical an engineer with a background within the engineering area, in which the students are studying. According to the curriculum, the main supervisor is responsible for supervision in technical part as well as, what we here call group dynamics. The second supervisor is more likely to have a background within social science. The second supervisor is responsible for helping the students to focus on; how society can make the best of the technology that they are working with. It is our experience that very often the second supervisor will also help the students with problems concerning group dynamics, whereas the main supervisor will only be concerned with the technical part. It is our belief that the main reason for this is that the second supervisor often has an educational background that makes it more obvious to focus on group dynamics.

Supervisors from other engineering colleges state that they do not regard group dynamics as something, which they should address. They do not know how to address it or they are simply afraid of, what will happen, if they try.

Although it is known that if the supervisor addresses group dynamics, the group's teambuilding will be improved, it is seldom done. Pedagogical Network for Engineering Education in Denmark (IPN) is helping teachers at the engineering colleges to improve their pedagogical skills giving courses and establishing networks for sharing experiences. IPN has identified the above problem and asked the authors to develop a course for supervisors about the addressing of group dynamics. In this paper, we will present ideas and methods of how to address group dynamics during a supervision session. We will also present and discuss how we have organised a course for supervisors and how it can contribute to the further development of the Aalborg model.

2. A MODEL FOR TEACHING AND LEARNING GROUP DYNAMICS

To a supervisor who is not familiar with supervising in group dynamics it can seem quite overwhelming to start doing so. To make it easy understandable what to do, and how to do it, we will introduce a special version of Kolb's learning circle, (Kolb 1984) with extra words (in italics) paraphrased by the authors (figure 1). Kolb's learning circle describes how people learn either from their own experience or from abstract theories. Kolb calls this the prehension dimension of learning. The knowledge can then be transformed trough a reflective process or through carrying out experiments. This is the transformation dimension of learning.

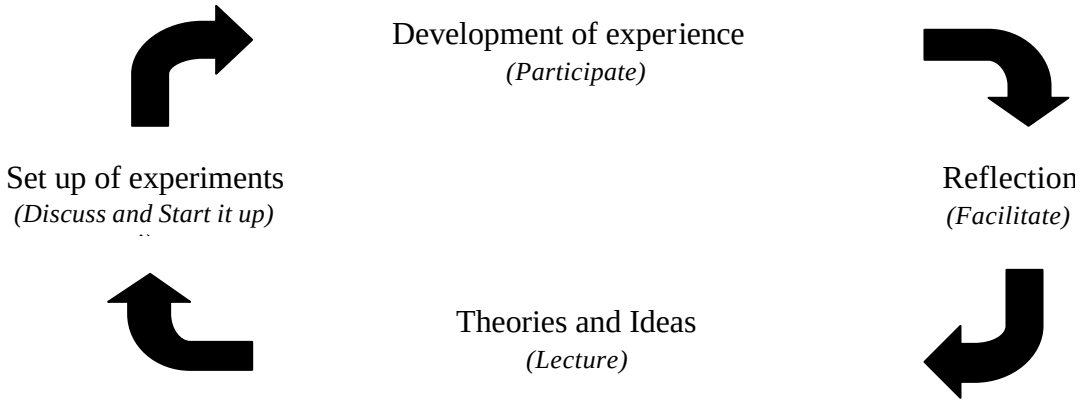


Figure 1. Kolb's learning circle, (Kolb 1984). The authors paraphrase the words in italics. The supervisor can participate in action, facilitate reflection, lecture on new theories and ideas or set up experiments for the students to try out.

Our contribution to the model is to suggest how a supervisor can help the students through respectively the prehension and transformation dimensions when learning group dynamics. According to the model, the supervisor can take initiative to create a learning environment based on reflections and experimentations. The supervisor may give a small lecture with inputs and ideas on, how to improve practice within the group work. To follow up, he/she can help the students prepare experiments for them to try out during the supervision session that follows. During the session, the supervisor may participate directly in the students' development of new experiences. After the session, he can facilitate reflection by asking reflective questions about the procedural topics in the preceding session. By acting reflective and experimenting, the supervisor demonstrates to the students that this is the way to do project work and to develop group dynamics. By inviting the students to join and by presenting options to choose from, the supervisor can initiate change processes, from which students will develop. It is important that the supervisor deals with all aspects of the model. If the students are to develop affective competences such as group dynamics, they must try out ideas in practice and afterwards reflect on them to develop further.

2.1. How to use the model in daily supervision

A way to implement this model in the supervision is proposed in figure 2. The "ordinary" professional supervision session can be expanded with a *pre*-session and a *post*-session as illustrated in figure 2. In the pre-session, group members decide which part of the process to focus on (communication, collaboration etc) and what to do. This is something that the supervisor can prepare in advance using his knowledge about the group's lack of competences. Here we are referring to group dynamics, but it could also be the professional aspects of the students project. In the *post*-session, the supervisor can facilitate, which might lead to further development. Facilitating should be asking questions that initiate a reflective dialogue in which the participants alter between looking back at what they have been doing to looking forward and planning what to do as the next step. John Cowan has named these specific reflections respectively reflection – on – action and reflection – for – action (Cowan 1998). The idea of expanding the supervision session with app. a 5 minutes pre- and post-session is to make it easier to include the aspects of group dynamics in the supervision without making many changes in the supervision methods in general.

Pre-session **Present a focus concerning group dynamics**	**Ordinary supervision** **Supervision session with "timeouts" used to discuss focus**	**Post-session** **Facilitate reflections on the focus**

Figure 2. The "ordinary" professional supervision session is expanded with a *pre* session and a *post* session where a focus concerning group dynamics is discussed with the students.

3. EXAMPLES OF TOOLS AND IDEAS PRESENTED TO SUPERVISORS AT A COURSE

In this section, we present examples of the tools and ideas presented to the supervisors during a course. The form of the course is a two-days workshop, where dialogue and exchange of experiences between the participants is emphasized. From the response we get from the participants, we are aware that the content presented must be very specific, motivating and inspiring. There is no need for introducing pedagogic or didactic theories of learning. The content must be related directly to the supervisors' own experience. Therefore, we find it important that the participants get the opportunity to reflect and discuss their own practice against our ideas. One way of doing that is to ask facilitating questions that initiate reflection of practice. Just like, we want the supervisors to facilitate their students' reflection. Another important aspect is to make it as much a

hands on experience as possible, so about half of the time is used on exercises and role-plays and the other half on a continues mix between the teachers presenting tools and ideas for supervision and discussions among the participants.

3.1. Focusing on improving the students´ communication

A supervision session with a group of six students, where theoretical aspects of a problem were discussed, is tape recorded, in order to be able to have a succeeding discussion of the communication in the project group. First, there is a pre session with a short presentation of both positive and negative types of contributions to the following discussion (bottom of figure 1). The used model for communicative behaviour categorises contributions in tree categories:

- Task-helping contributions that are helping the group getting on in the discussion. E.g. by proposing a new concept, summarising the discussion, or testing, whether there is a common understanding in the group.
- Contributions that promote the communicative environment. E.g. by encouraging others to participate, to follow others ideas and to be open-minded.
- Contributions that are categorised as non-functional behaviour. E.g. defending his or her own position, attacking another person's position, over talking or chatting.

Throughout the following session (top of figure 1), the supervisor should be communicating in the same way, as he wants the students to communicate (task helping and promoting contributions). He or she could also use small timeouts to remind the students on the focus.

In the post session, a part of the tape was played for the students. While listening to the tape, the students categorize their own contributions in accordance with the communication model presented ahead of the session (right part of figure 1). Afterwards the supervisor and the students discuss, how to improve the communication in the future (left part of fig 1).

While reflecting on the communication, examples of functional and non-functional contributions will be recognized, and each student should write down, in which way he or she wants to improve in the following discussions. Throughout the rest of the semester, the supervisor may, from time to time, make a short timeout during a supervision session and ask the students about the communication. Has it improved? In what way has it improved? How can it improve further? In this example, consciousness about communication is developed and compared with a theory of good communication.

3.2. Addressing project management using facilitative questions to start reflection

Very often, a group of students who are novices in project management will set out to agree to have a collective management, where everybody makes decisions in common. They do not want a chairman during the meetings and they have no rules for good behaviour, or how to work as a team. It is possible as a supervisor to facilitate the groups' development of skills in project management by asking questions such as:

• Why do you not have a project manager in the group?
• How are the group organising project management?
• Which tasks are the management system facing?
• How are you going to organise to deal with those tasks?

Such questions can initiate a reflection of the group's experiences with project management. During the discussion, the supervisor may present concepts of good management rules and reflect together with the students about similarities and differences compared to their own experiences. A result from such a discussion should be the students´ own list of operational learning objectives.

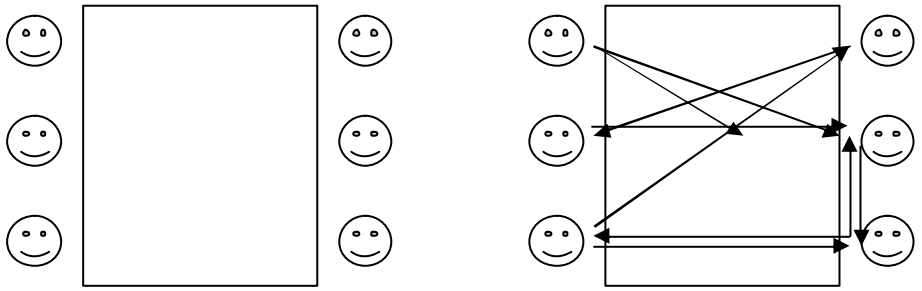
3.3. Introducing the communication diagram

Having groups of five to seven students, we often see that discussions within the group are unbalanced in the sense that not all the students participate or some of the students almost do all of the talking. A simple way of revealing this is to draw a diagram of who is talking to whom during the discussion. It is called a communication diagram (see figure 3) and can be used in several ways.

The supervisor might use it to show that the discussion is unbalanced, simply by drawing the diagram, when he participates in a meeting/discussion and then the supervisor may show it to the group afterwards, in order either to discuss the pattern with them or leave it up to the group to discuss what to do. This is a special way of facilitating a reflection (right part of figure 1) about communication.

A common example is that two group members sit next to each other and discuss other matters than the rest of the group (e.g. football). In other words, if the two people in the right down corner of figure 3 had several arrows between them. A simple solution of this could be to move one of the two people to the upper left corner and draw a new diagram during the next discussion to see, whether the communication pattern has improved.

The supervisor might also suggest an experiment (left part of figure 1) of replacing the students around the table using the communication diagram (Jaques 2000) to see whether it changes the communication pattern. The students often use this solution, when they have seen the communication diagram in use.



Draw how the members of the group are placed around the table

Draw arrows for each contribution to the discussion for about 5 min.

Figure 3. The communication diagram (Jaques 2000), showing all contributions made by the group members in a discussion.

3.4. Participating in structuring a project

A supervisor may experience that discussions with the students are insufficient to make them understand ideas about proposed changes to the project. Sometime the supervisor's participation (top of figure 1) in doing the project is needed. One example of this could be the task of structuring the project after having formulated the problem.

As a tool for structuring the project, the supervisor can introduce the "Post-It brainstorm" method. The idea is to write down everything that comes to mind concerning the project on Post-It notes. Then the group should structure the notes. The good thing about Post-It notes is that they can easily be restructured, when there is a good argument for doing so.

The supervisor may then tell the students that for the next hour or so, he is member of the group taking part in the Post-it brainstorm. In that period, he is no longer a supervisor but an experienced member of the group who has an idea about, how to proceed. During the session, it is important that the supervisor acts as a group member and not as an authority. He or she most NOT do all work, but instead bring forward suggestions and insist that they are followed up by action. After the session, it should be clear to the students, how they can complete the structuring task.

At the end of the session, the supervisor can facilitate a reflection (right side of figure 1) about the methodology, which they have just used. This might make it easier for the students to complete a similar task in the future.

4. EXAMPLE OF HANDS-ON EXERCISE – ROLE-PLAYS

Role-plays are very useful to obtain hands-on experience, when a real world situation is not present. The entire morning of day two is used for approx. six role-plays, where the participants switch between playing the role of different groups with some kind of difficulties, and the role of the supervisor trying to supervise these groups.

The role-plays illustrate supervisor meetings. The group will have already given an agenda to the supervisor (the topic that the group wants to have discussed at the supervisor meeting). The group members assign roles between themselves, so that the outlined situation in the role-play occurs. The participants who are not playing are observing the plays. Each role-play lasts approximately 15 minutes. Afterwards there is a discussion on, how the supervisor dealt with the situation, based on the observations and the participant's experiences, and a more general discussion about, how this kind of conflicts can be handled. The use of role-plays has proven to be a good way of initiating reflections about supervision. The participants very often get ideas about their future experimental supervision

4.1. Example of a role-play:

The group is a very nice and extremely bright group. They work hard and read everything that they are told to. However, none of them does anything, which are not supported 100% by their supervisor. In other words, this group is very orthodox. Meaning that the group has a hard time carrying out a real discussion on their own. This is expressed at the supervisor meetings. Everyone is very quiet and cautious and finds it hard to take a critical position to each other's work. At the supervision session, everyone in the group delivers nice work papers. However, none of the work papers has been discussed beforehand within the group. Everyone wants the supervisor's evaluation first.

Besides illustrating a situation, where the supervisor have to address group dynamics, if he wants to assist the group to improve their work by themselves, it is also an argument for doing it, because otherwise the supervisor will have to do all editing work for the group. On the other hand, if the supervisor can convince the group of the necessity of reading and discussing their work papers themselves, the group's work and ability to take critical positions will improve dramatically and the supervisor will be presented with work papers already well edited.

5. HOW CAN THE COURSE INFLUENCE STAFF DEVELOPMENT AND CONTRIBUTE TO THE DEVELOPMENT OF THE AALBORG MODEL

We believe that the development of a learning culture mainly is taking place in a process of continuous reflections and experiments. This is exactly what this course represents. The course content is developed through years of experiments. The course is structured to initiate reflections among the participants and to inspire them to make their own experiments. As teachers we also gets inspiration from the dialogue with the participants. In a way, the course can be considered as a workshop where changes in learning cultures are initiated. The question is of course whether anything will change when the participants get back at their home institution. We do not know that, but from Delphi evaluations, where each participant write down tree good experiences from the course and tree things that did not work so well, we know that most of the them felt inspired to address group dynamics in their future supervision. They liked the hands-on parts like role-plays very much, because, besides the actual experience it was an excellent opportunity to exchange many experiences and ideas from the participants' own practice. They also favoured the presentation of specific ideas and tools that they can use more or less directly in their future supervision. This result is very satisfactory, because in the beginning of the course many of the participants expressed concern about, how to discuss group dynamics with their students.

5.1. Further development of the Aalborg model

Giving courses like the one described in this paper is a contribution to spread elements of the Aalborg model to other institutions. This process has been going on for many years. The Aalborg model has inspired most engineering colleagues in Denmark together with many institutions in other countries, but they do not necessarily implement it the same way as we have done in Aalborg. Learning about how the Aalborg model has been implemented in other institutions is a vast source of inspiration that we can use in our own development. This is exactly what we experience through the discussions with the course participants. This way we consider a course, as the one described in this paper, a way of developing the Aalborg model. Here are some examples of that we have learned:

- A much more focused view of our own model and method for supervision due to reflections, when developing a course for experienced teachers and the actual discussions with the participants
- A deep knowledge of a lot of different practices for both project work (length and type of projects), supervision and examination
- A lot of good ideas for handling group dynamics (different kind of conflicts)
- Specific ideas of other usable exercises and different ways to use our exercises
- Specific ideas for new teaching experiments

5.2. Lessons learnt from similar courses

Due to the great interest in the Aalborg experiment and its special way of handling PBL, the authors have also been involved in other courses, where we have used the hands-on exercises from this paper to give people from other countries and learning cultures an idea of both, how we do in Aalborg and the potential of this. In these cases, the role-plays once again proved extremely good for both hand-on experience and exchange of practice and ideas on an equal level, in order for the teacher also to benefit. One lesson learnt was that the participants in one course might have another professional background than in the last course, hence, they will benefit more from an exercise, if it

is slightly altered. To find out, whether this is the case, it is a very good idea to present not only the idea of a specific exercise for the participants but also the "hidden" why's and what's that we as teachers considered (reflected), when planning the course. In that way, the participants are able to reflect upon, how they can benefit the most from the exercise, and it will help them and the teachers to focus on the learning outcome of the actual exercise.

5.3. An example of didactic development at Aalborg University

The learning model presented in figure 1 can be regarded as a general model for teaching and supervising in the problem-based and project-organised study at Aalborg University. Teachers and researchers responsible for giving the course "Collaboration, Learning and Project Management" (CLP) which is offered to students at the basic year have developed this model. The CLP-group is an example of, how a didactic approach in higher education is developed, when teachers and researchers combine their efforts to do so. The actual development was made by using figure 1 as a development approach combining learning theory and our own experiments. The reason for pointing that out, is to suggest that didactic development in higher education often depends on having a group of staff members who feels committed to develop their teaching and who wants to exchange ideas and experiences.

6. CONCLUSION

The Aalborg experiment were launched almost thirty years ago, but it is still alive and maybe more popular than ever. Although we often talk about the Aalborg model, this model is not the same at all faculties and it is not a static model, because the implementation of it is ever changing, according to both study guidelines and teaching. From the start, it has been a part of the culture at the University to do excellent teaching and throughout the years, the teachers have struggled to get the most out of the Aalborg model. Looking at the engineering educations, a lot have been gained in teaching courses and supervising technical issues, so one of the potential of greater improvements now is in addressing the group dynamics, which can improve group performance and learning capacity significantly.

This paper has argued that although it is stated in the curriculum for the first year studies that the supervisors must address group dynamics, they have difficulties in doing so because they do not know (have not learnt) how to do so. Experiments with short courses for supervisors from engineering colleges have shown that it is possible both to inspire them to address group dynamics and to give them tools and ideas of how to do so. The main reason for accomplishing this in a short time is that teachers have many experiences that is shared and discussed during the course. This great potential of knowledge about what to do as a supervisor in different situations is seldom shared at the home institution, due to lack of time and low status in discussion of pedagogical issues.

It is the belief of the authors that a simple and low cost way to staff development and improving the practice of the Aalborg model is to create legal forums, e.g. at the first year of the engineering studies, where teachers can discuss supervision in group dynamics, exchange experiences and knowledge about theories and new ideas. Then the supervisors should plan small experiments with this kind of supervision and later on report the results to the forum, in order to reflect upon their experiences.

There is probably still a need of actual courses, such as the one described in this paper, e.g. for newly employed teachers or teachers at other engineering educations. So another possibility to

develop yourself is to take the challenge of giving such a course and sharing your experiences with others, and that way gain very much by getting access to the participants experiences.

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