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Training IT Managers*

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Abstract. Information technology (IT) organizations are facing important challenges. They must respond to new technologies and business applications and at the same time provide quality services that satisfy the present needs of their client organizations. The Chief information officer (CIO) of a Danish financial institution experienced increasing problems with internal recruitment of managers with sufficient and suitable competence to face these challenges. As a consequence, he decided to establish an ambitious in-house training program aimed at developing appropriate managerial skills and attitudes.

The paper presents a number of tales about this training program, each of them told from a different perspective and with varying degrees of interpretation. The paper first describes the training program, its context, the initial design, the process, and the results. The program is then evaluated from different viewpoints: the sponsor and designers, the trainees, and the IT organization. Subsequently, the program is discussed as an action learning activity in which individual learning interacts with the organizational context. Based on these analyses normative propositions are made about action learning as a strategy for developing managerial skills and attitudes as part of the ongoing transformation of IT organizations.

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1. Introduction

The rapidly changing information technology (IT) and the increasing demands of organizations and individuals using IT generates considerable pressures on IT organizations. They must perform effectively under present conditions, and, at the same time, they are obliged to frequently change in order to benefit from new technological options. The conventional way for IT organizations to meet this challenge is to take resort to frequent technological and structural interventions. This paper presents a supplementary strategy based on comprehensive in-house training of future IT managers. More specifically, we investigate how action learning can be used to develop appropriate managerial skills and attitudes as part of the ongoing transformation of IT organizations.

Case. The research is based on a field study (Andersen *et al.* 1995) within a Danish financial institution with approximately 12.000 employees including a little less than 1.000 employees in the internal IT department (Borum *et al.* 1996). The institution is a recent merger between three independent financial operators each with its own IT organization. One of the strategic decisions in the new IT unit has been to focus on technological and structural integration guided by the slogan: “One institution, one system”.

During the considered period, a new computer aided software engineering (CASE) tool has been adopted, the emphasis on quality in IT services and systems has increased, and as in most other organizations the use of distributed IT solutions have grown. On top of this, IT management has had to reduce staff as part of a general reduction policy in the mother organization, while at the same time trying to raise the IT competence level in the organization.

In this situation, the Chief information officer (CIO) experienced increasing problems with internal recruitment of managers with sufficient and suitable competence to modernize the IT organization. As a consequence, he decided to establish an ambitious in-house training program to develop future managers' skills and attitudes. The manager of human resources was made responsible for the program, and the authors' were called in to assist with the program design and as trainers.

Approach. The presented research is—like most case studies—of an interdisciplinary nature: it addresses and contributes to the ongoing debate within information systems and software engineering research on how to professionalize the IT industry (e.g.

Couger 1988; Swanson *et al.* 1989; Earl 1989; Humphrey 1989; Cash *et al.* 1992; Mathiassen 1995); it draws on and exemplifies literature on organizational learning and change (Chin *et al.* 1970; Schein 1985; Strandgaard 1991; Borum 1995b; Argyris *et al.* 1996); and it draws on and contributes to the literature on how professionals learn in practice (Evans 1982; Schön 1983, 1987; Ballantyne *et al.* 1995).

Our different roles as consultants, trainers, and observers made possible a blend of action research (Argyris 1970; Borum 1995a), participant observation (VanMaanen 1988; Andersen *et al.* 1995) and traditional case study data generation (Yin 1994). This combined approach provides a rich insight into organizational phenomena and allows for validation and triangulation between different types of data. The objectivity of our data is, however, limited due to our active involvement. We cope with this by structuring the argument into distinct tales or sections (VanMaanen 1988). The paper describes the training program (section 2). The program is subsequently evaluated from different viewpoints: the sponsor and designers (section 3.1), the trainees (section 3.2), and the IT organization (section 3.3). The program is then discussed from two related perspectives: as individual learning (section 4.1) and as part of a dynamic organizational context (section 4.2). Our experiences are finally summarized as specific lessons on how to develop managerial competence in IT organizations (section 5).

2. A management training program

The CIO decided to launch the training program during Spring 1992, approximately two years after the announcement of the merger. A task force consisting of the program manager, two assistants and an external consultant (one of the authors), was established to design the program. The content was specified as a combination of the following four topics: information, technology, and management; organization, strategy, and management; economics and finance; and managerial techniques. The first two topics constituted the main stream of the program whereas the latter two were organized as a parallel track. The task force decided to design the program as an action learning effort (Evans 1982; Ballantyne *et al.* 1995) and settled for some basic principles:

- Combination of practice and theory, applying theory to situations and problems within the organization.
- Apprenticeship model with trainee and mentor roles in practical work settings.
- Rotation of trainees between different departments.
- A university level curriculum that should support critical reflection and organizational learning.
- Recruitment of trainers from university institutions.
- Examination with external censorship and grading according to the official Danish scale.
- Writing of a final thesis in which theory should be applied to practical managerial problems within the IT unit.

The profile for the trainees was described as follows: age (23–35 years), educational background (programmer or analyst, financial education with 2 years vocational training on top, computer scientist, engineer or economist), reasonable competence in English, minimum 1–4 years of seniority in the IT unit, ambitions to qualify for a managerial position, and the following personality traits: willingness to make an extra effort, self-confidence, enterprising, extrovert, collaborative, result oriented, and resolute.

The management training program was designed for 20 trainees and the duration of the study was 1.5 years during which the trainees were expected to allocate 50% of their working hours to projects and course activities and 50% to management related work. The number of class hours was around 750 to which preparation, project work, and thesis writing had to be added. All trainees ended up working in total more than 40 hours per week.

One of the authors staffed and made a detailed program for “Information, technology, and management” together with a team of colleagues, and asked another of the authors to take responsibility for “Organization, strategy, and management”. This part of the program was designed and implemented in collaboration with two colleagues including the third author. A survey of these modules is shown in figure 1.

An internal recruitment process of trainees and mentors was organized as a formal application-selection procedure with a round of pre-screening, interviewing, and selection seminars. 70 applications were filed for the 20 traineeships and 16 applicants were

Spring 1993: Organization, Strategy, and Management (144 class hours)

Module 1. Organizational structure (January 25–27)

Module 2. Cultural analyses (February 8–10)

Module 3. Strategy and management (March 10–11)

Module 4. Decision-making and change processes (April 24–26)

Module 5. Leadership and group process (May 8–10)

Examination (May 17–18)

Fall 1993: Information, Technology, and Management (134 class hours)

Module 1. Strategy and problem solving (August 4–6)

Module 2. Quality and quality management (August 25–27)

Module 3. Technological innovation (September 22–24)

Module 4. IT philosophy and practice (October 20–22)

Module 5. Management of technology (November 11–12)

Examination (November 25–26)

Spring 1994: Final project and writing of thesis

Projects in groups of 1–3 involving mentors and a supervisor.

Final examination (June 16–17)

Figure 1. Survey of courses on major topics.

found to qualify. Subsequently 4 section managers were included into the program.

Each module was arranged as a three- or two-day course with overnight stay and approximately four weeks between modules. Guest speakers from the financial institution and from outside the organization were invited to take up a particular subject relevant to the theme in question. Concurrent with the modules the trainees organized several projects involving their mentor and a supervisor. These projects used theories from the courses to address managerial issues within the organization.

All 20 trainees passed the final examination and they were, based on all exams, evaluated with an average of 8.7 on a 13-scale, where 13, 11, and 10 indicate excellent work. One year after the training program ended, 18 management trainees were still in the organization. 2 had left for jobs in other companies. Two years after the training program, 8 trainees occupied managerial positions in a

revised organization after the conversion of the IT unit to a profit based software house.

12 final theses (in groups of 1–3) and a number of project reports were written. These took up a wide range of themes relevant to the IT unit, see figure 2. The reports were read with great interest by top IT managers and mentors. Some of the reports were seen as provocative and caused debate and some were put forward as proposals that were implemented or contributed to launch further analyses.

The training program was regarded as a success and was repeated in 1995 with some modifications: IT-users from outside the IT unit were invited to apply, and a less aggressive internal marketing process was employed to lower the trainee's expectations of promotion as a guaranteed result.

3. Evaluations

We have applied multiple sources and perspectives to evaluate the program (VanMaanen 1988). These evaluations are expressions of viewpoints held by actors related to the program and they are based on documents, interviews, a survey, and elaborate narratives written by selected trainees.

3.1. Sponsor and designers

The sponsor and program manager describes the motivation for the training program as follows: "Top management in the organization

An Experiment in Business Process Re-engineering
Implementing a Case-Management System
Dialogue in Systems Development
Quality Management in Systems Development
Better Test
Managing CASE Adaptation
Groupware in the IT Unit
Organizational Development in Systems Operation
A Resource Perspective on Systems Operation
Integration of Distributed and Centralized IT
The Dilemma of IT Managers
Strategic Management: An Organizational Change Perspective

Figure 2. Titles of final theses.

experienced some problems concerning recruitment of IT managers. They decided to solve this problem by launching a training program aimed at increasing the potential for recruiting new managers . . . Our experience with existing in-house educational programs was good—selecting and teaching some theoretical issues and then combining this with our company's values and in this way influence the culture."

The apprenticeship model is motivated by the sponsor and program manager: "We had recruited some academics a year and a half earlier, who were pretty far away from reality—this meant we had to have some on-the-job-training and a mentor role, which was incredibly important together with organizational rotation of trainees. This gave them some areas to work with and apply their theories to."

Even though many resources were put into the program the sponsor and program manager did not consider it a high risk enterprise: "We were fairly certain that it was necessary to do something and that it was a good idea. It was a low risk project because we had bigger ships sailing at the same time." In order to secure high quality, trainees and mentors were found through the elaborate selection process and trainers were selected based on personal networks and trust. The external consultant experienced it this way: "The organization wanted me to be active in designing the program and selecting the trainers. In this way the organization wanted to make sure that traditions and sense of quality from existing university educations were incorporated."

All management trainees passed the final examination, but cultural influences, network building, organizational development, and an increased focus on management and career possibilities are added as important effects by the sponsor and the program manager: "Yes, yes, organizational development and attitudes, you can say, as a side effect by running the program internally. You also build a network for the young people." In addition, "many of the existing managers saw this as a potential threat and said: What do we do? What educational options does the institution give us? In this way we got a lot of people started moving in the entire organization." Today "the problem we had in 1990—i.e. our middle management—has been improved considerably both by the program, but also by new recruitments." Moreover, the trainee projects from the program contributed to the more general unfreezing and change of

the organization: “The projects question our routines and the ways we usually do things around here—some have been used others have not.”

The sponsor and the program manager find that the loyalty among the organizational members has become less strong. They do not attribute this solely to the program, but as well to increased personnel turnover and change of recruitment profile away from in-house trained, financial people towards people with higher educations (computer scientists, engineers, economists). Despite their efforts, the sponsor and internal designer found that the program did create quite unrealistic career expectations among the trainees: “Well, some of them got too high expectations, and have difficulties in understanding us when we say that they also need some skills in other areas e.g. more practical experiences.”

3.2. The trainees

Additional evaluations are provided by four trainees. All four have positive evaluations of the program’s action learning approach and of the main stream of courses on organization and technology. The last three have an academic background and were recruited to the IT unit one year before the start up of the training program which to them represented a most welcome occasion for further personal development.

First trainee. With a practical IT background, she had been working for several years in the financial institution. She considered leaving the organization due to lack of future prospects when the program was launched and created new possibilities and career prospects. She was urged to apply, and did not experience the selection process as too tough. The training program was a positive experience, but the mentor arrangement was a dubious concept and a poor experience. The de facto shift from having her base in the organization to having the program as anchoring point was a strong experience.

The main effects of the program were a better ability to use theoretical frames for practical purposes, strengthened personal development, and increased visibility in the organization. She doubted about any significant organizational learning effects after the sponsor and program manager were moved to positions outside the IT unit. She eventually decided to leave the organization. Her many years of previous experience and reputation did not count any more,

the middle managers "stroke back", and top management backed out of initial promises concerning promotion.

Second trainee. He was encouraged to apply and found the selection procedure tough—"military style." The program itself was, however, a positive experience, in particular the collective spirit among the trainees—although the tensions in relation to the latent individualism created existential crises. For him the program resulted in increased awareness of managerial processes and of oneself. His understanding of organizational phenomena was considerably strengthened.

The program led to some organizational changes, which were positive, but his personal ambitions of a managerial career were not fulfilled. Being moved to another project was frustrating, and he became critical towards the organization which he considered to be rather traditional.

Third trainee. The program was an opportunity for personal development—at a time when she did not have clear ideas on her future affiliation to the organization and on a possible managerial career. The trainees developed into a good team with good discussions and friendships. But frustrations occurred during the program, and it was at times difficult to strike the balance between individualism and sharing. The mentors were of mixed experience.

The effects of the program were mainly positive: personal development and insight into own strengths and weaknesses; knowledge on organization and business; increased visibility in the organization; and creation of a useful social and professional network. The most negative effect of the program was the defensive reactions of the middle managers. She was appointed project manager and developed very good links to centrally placed managers. She consider this acceptable, but she wants something to happen in the near future.

Fourth trainee. He was disappointed and restless due to lacking challenges. The program was an opportunity for change—albeit not an obvious one. Why take a nonacademic degree? On the other hand it might be a means for better exposure and for getting more managerial attention. He has a positive evaluation of the program as it contributed to his personal development and to his achievement of career goals. With regard to the personal aspects it was in particular managerial skills and the ability to interpret and understand organizational phenomena that were valuable.

During the program he was surprised to discover many trainees' lacking management orientation. He was also disappointed to discover how the organization tried to seal off the trainees from influence and he found that the program manager's move to another position in the mother organization implied a major set-back for the program in terms of its organizational awareness and impact. His ambitions were satisfied as he shortly after the program was promoted to a position as section head.

3.3. The IT organization

A broad evaluation of the program is expressed in a survey (see Appendix) which includes all trainees (20), their mentors (20) and a selection of organizational spectators (20) who did not participate in the program, but experienced it as ordinary members of the IT unit. With a high response rate (48 out of 60: 80%) the survey expresses additional evaluations:

- Both trainees and mentors (30 out of 32: 94%) find that the program had considerable positive impact on the trainees competence as active participants in transforming and modernizing IT organizations in general. Spectators have mixed evaluations on this issue.
- In contrast, most trainees, mentors, and spectators (32 out of 48: 67%) find that the competence of the trainees—so far—only have been utilized a little, or not at all, to transform and modernize the financial institute's IT activities.
- However, mentors in particular (14 out of 15: 93%) and also most trainees (10 out of 16: 63%) expect that the trainees' competence will be utilized in the future transformation and modernization of the financial institution's IT activities. Spectators have mixed evaluations on this issue.
- Both trainees (14 out of 17: 82%) and mentors (12 out of 15: 80%) find that the education have meant something or a lot for their own work and personal professional development. For the spectators (13 out of 15: 87%) it has only meant a little or nothing at all.
- Moreover, most mentors (10 out of 15: 67%) find that the program have had considerable effect on other persons and activities. Only half of the spectators (8 out of 16: 50%) and trainees (7 out of 16: 44%) agree on this. The other half of

the spectators and trainees find that the program have had little or no effect on other persons and activities.

- Most mentors (12 out of 15: 80%) find that few or no organizational and cultural barriers have prevented effective utilization of the trainees' competence to transform and modernize the financial institution's IT activities. In contrast, most trainees (14 out of 17: 82%) and spectators (9 out of 14: 64%) find that some or many such barriers have prevented effective utilization of the trainees' competence.

Based on these data, the voice of the organization is quite clear on a number of issues: the program is viewed as a success at the individual level for both trainees and mentors, and the education has for both these groups meant something or a lot for their own work and personal professional development; there is widespread consensus that the trainees' competence, in general, only have been utilized a little—or not at all—to actually transform and modernize the financial institution's IT activities; most respondents find, however, that the program had much or some effect on other persons and activities even if the mentors evaluations are the most positive, while the two other groups have mixed evaluations.

The groups have different predictions of the future utilization of the trainees' competence and different explanations of the rather weak utilization of these so far in transforming the IT unit. Mentors have high expectations to the future utilization of trainees' competence, trainees have mainly positive expectations, whereas spectators have mixed evaluations on this issue. Mentors do not use organizational and cultural barriers in the IT organization as major explanations of the weak utilization so far. The mentors claim that "all members of the IT organization can influence the IT activities . . . It is entirely an individual responsibility to obtain results and personal impact. The education has merely established a platform for influence." In contrast, both trainees and spectators use organizational and cultural barriers as major explanations. Some trainees find that "managers have authority, non-managers haven't." In addition, "many managers consider the trainees as competitors for their jobs", and there is, in general, "a certain level of skepticism or resistance towards theories in the IT organization."

4. Discussion

The principle of action learning explicitly aims to improve the performance and learning of both individuals and organizations (Ballantyne *et al.* 1995). In our case, the primary intention was to create a learning environment in which the trainees would develop their competence as IT managers. But it was also the ambition that the program should have wider organizational effects and in this way contribute to the ongoing modernization of the IT department. In the following we discuss the individual learning and the rather complex interactions between the program and its organizational context.

4.1. Individual learning

Besides being equipped with a rich repertoire of technological and organizational frameworks and methods, IT managers must understand the specifics of the organization in which they work, and they must learn to cope with emerging situations where their repertoires of frameworks and methods are inappropriate and existing traditions are challenged. This was the rationale for designing a program in which trainees would apply theories to the organization, engage in dialogues with mentors in practical work settings, and be challenged to understand multiple perspectives through departmental rotation. This action learning model appears to have worked well as a means to train future IT managers and it was highly appreciated by the trainees.

Following Schön, our ambition was to develop reflective practitioners through a process in which "trainees learn by doing, and instructors function more as coaches than as teachers. In the early stages . . . confusion and mystery reign. The gradual passage to convergence of meaning is mediated—when it occurs—by a distinctive dialogue of trainee and coach in which description of practice is interwoven with performance" (1987, p. 20). During the courses the trainees learned new theories and methods by discussing them and applying them to particular examples. Beyond these simple applications the trainees were challenged to apply theories and methods to real situations in the IT department both through the assigned projects and through practical work. These efforts invited them to develop personal interpretations of the material taught in the courses and in some cases it led to diagnosis in which they had to go beyond the presented theories to search for new rules and concepts

(Schön 1987, p. 35). According to the trainees, this process resulted in three types of individual learning: learning about oneself (individual development), learning about the application of theoretical schemes to practical settings (professional IT management), and increased insight into the organization (organization analysis).

In action learning, trainees practice in a double sense. They "engage in the practice they wish to learn. But they also practice, as one practices the piano" (Schön 1987, p. 38). In our case, this practice took place as social interactions between trainees, mentors, and coaches. The trainees had mixed evaluations of the apprenticeship model as the success of the arrangement was strongly dependent on the qualifications and attitudes of the mentor and of the personal relationship between the trainee and the mentor. In contrast, all trainees evaluated group work and dialogue as key ingredients in learning both about the organization and about personal strengths and weaknesses. This viewpoint is supported by Schön who finds that the group of trainees often successfully play the role of coach to each other thereby helping the individual to learn new habits of thought and action (Schön 1987, p. 38).

4.2. The context

While all evaluations suggest that the individual learning processes benefited from being integrated into the organizational context of the IT department other types of interactions between the program and the organizational context are ambiguous and more difficult to interpret.

The increasing problems with internal recruitment of managers was, of course, only one amongst many challenges faced by the IT organization. But even though the CIO and other top managers allocated limited time to the program, their commitment and active support was demonstrated in several ways through: the resources allocated to the program; the heavy internal marketing of the program; the establishment of a task force to develop the program; participation as guest speakers revealing strategic considerations and plans; their interest in the trainees' analysis; their awareness of and efforts to benefit from the program's side effects. This high level of commitment and active participation was instrumental in establishing the program and making it a success, and it was therefore later experienced as a setback when the sponsor and the program

manager left the IT unit to become engaged in managerial positions in the mother organization.

Top management learned from the program as the trainees' analyses revealed the organizational culture and general traits. The sometimes provocative analyses created a better appreciation of the need for and obstacles to transformation of managerial values and practices and they challenged top management to clarify what it wanted to maintain and what to change. The trainees' analyses did also activate negative reactions both among middle managers and top management. But as these analyses were legitimate and theoretically founded, it was difficult to discard them. Instead, it became possible to discuss whether negative reactions to a project reflected faulty analyses or defensive routines (Argyris *et al.* 1996).

High status was attributed to the program. Many applied both as trainees and as mentors, but few were chosen through the elaborate selection procedure. Taken together with the program's intended and announced function—as a step in the maturing of persons with a potential as future managers—participation in the program came to signify inclusion into the managerial world. At the same time, however, the trainees shifted their attachment from their organizational unit to the program, as it was reflected in the strong network they formed. Even though the network operated as a location for organizational knowledge in which analyses were shared and mobilized for other work-related tasks and events (Brown *et al.* 1991), it represented a subculture that constituted a threat to the dominant culture (Ciborra *et al.* 1994). The network continued to exist after the completion of the program, giving way to some conflicts.

The program had some positive effects on the organizational context. Organizational routines and practices were modified based on a number of the trainees' analyses and proposals, and insights were created not only at the trainee level, but also in managerial positions and networks. The inclusion of the mentor role resulted in most mentors feeling responsible for the trainees' projects and in their learning from the analyses of organizational issues—even though the program's theoretical schemes remained distant to them. In this way the learning processes included parts of the managerial layer which was defined as a problem for the organization. So far the trainees' competence have, however, only have been utilized a little—or not at all—to actually transform and modernize the finan-

cial institution's IT activities. There are positive expectations to the trainees future role in changing the IT organizations—even though there is disagreement on whether the organizational learning system will promote or inhibit further use of their insights and experiences (Schön 1983; Ciborra *et al.* 1994; Argyris *et al.* 1996).

5. Lessons

Our experiences are supported by a similar case where action learning was successfully used within the specific area of strategic information systems planning (Ruohonen 1990, 1991). In this case, 15 managers participated in a series of six seminars and five workshop to learn about strategic information systems planning and more specifically to: evaluate the present IS operation, to increase cooperation between business and IT managers, and to actually create an information systems strategy for the organization. Experiences from the two cases suggest that action learning is an effective approach to develop management skills and attitudes as part of the ongoing transformation of IT organizations. Taking the challenges faced by IT organizations into account this is not surprising as action learning aims at developing competence and organizational environments that can cope effectively with uncertainty and change (Ballantyne *et al.* 1995).

5.1. Program design

Action learning is a general principle that can be adapted and further developed in specific contexts (Ballantyne *et al.* 1995). The management training program presented in this paper and the project presented in (Ruohonen 1990, 1991) are two such case, in which the general principles have been projected and transformed into the IT field in the context of a particular organization. Figure 3 summarizes our approach to action learning focusing on four dimensions: the underlying pedagogical principles, the types of knowledge included, the organization of the process, and the key stakeholders involved. For each dimension we offer some lessons and a set of complementary concepts that describe options and challenges involved in organizing in-house training programs to develop managerial skills and attitudes in IT organizations. We relate the proposed concepts to the experiences reported in (Ruohonen 1990, 1991) to

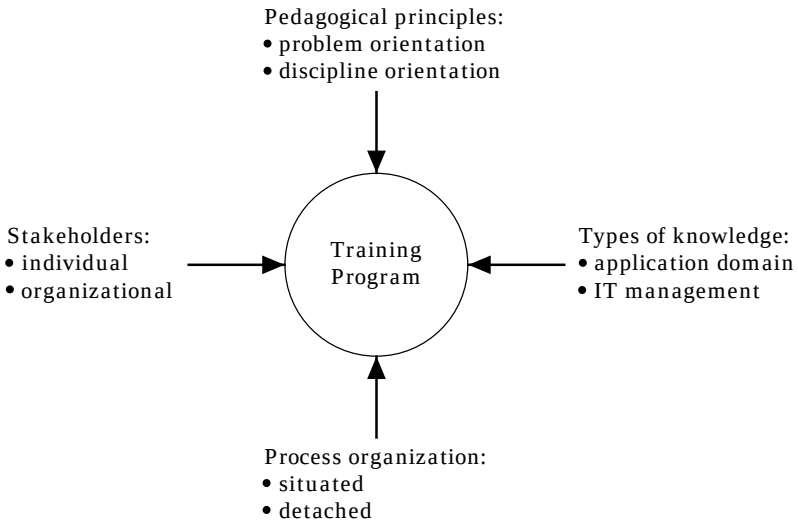

Figure 3. A model for action learning.

illustrate how they can be used to reflect upon and design a variety of action learning activities.

Pedagogical principles. Action learning confronts reality rather than studying a hypothetical situation (Ballantyne *et al.* 1995). In our case, the trainees organized projects on issues that were experienced as problems or challenges in the IT organization. At the same time they attended courses on state-of-the-art concepts and methods related to management of IT. This combination of problem oriented and discipline oriented activities represents a fundamental dilemma involved in all learning processes: the concrete versus the abstract (Kolb 1984). Disciplines provides rich sources of inspiration, but they need to be confronted with concrete problems to support effective learning. We recommend to combine practical work and projects focusing on managerial problems in the IT organization with courses or seminars on general disciplines related to IT and management. Ongoing structural and technological interventions are useful arenas for trainee projects because they challenge trainees to understand the deeper levels of the organizational culture (Schein 1985) and to experiment with different strategies for change. On a more practical level trainee projects should have a sponsor and be based on formal contractual arrangements to ensure

appropriate organizational commitment and support useful interaction between trainees and organizational processes.

In Ruohonen's case, the process included issues from disciplines involved in strategic information systems planning, e.g. forces of competition and their effects, alignment of business and information system strategies, and the contents of and requirements to information system strategy formulation. But the whole process was organized as a project to increase cooperation across departments and to develop an information system strategy for the organization (Ruohonen 1990, 1991). Ruohonen's case had, in this way, a stronger problem orientation and put relatively less emphasis on disciplines as compared to our case.

Types of knowledge. IT offers general solutions to information processing problems. But to manage IT effectively we must relate to specific application domains and business needs (Cash *et al.* 1992; Dahlbom *et al.* 1993). As a consequence, our discipline oriented course activities emphasized both general knowledge about the use and management of IT and specific knowledge about the application domain in question. In this way, the trainees became better equipped to understand and manage the interactions between the IT organization and the customer or client organization. This provision of knowledge and the evaluation of trainee performances were governed by academic virtues to develop the trainee's higher order skills such as the ability to learn, to ask critical questions in front of risks, and to make sound judgments in uncertain and ambiguous situations (Ballantyne *et al.* 1995).

A series of seminars and workshops were, in Ruohonen's case, organized as an iterative process in which general knowledge about strategic information systems planning was presented through lectures, subsequently to be discussed and applied to the organization. This process emphasized both business needs and IT related issues with the purpose of reaching a coherent and holistic view of the strategic use of IT in the organization in question (Ruohonen 1990, 1991).

Process organization. Action learning is primarily work-based rather than classroom-based (Ballantyne *et al.* 1995). In our case, the training program was organized as an integral part of the IT organization to help trainees relate theoretical concepts and methods to real-world problems and to facilitate organizational learning as a result of the program. This integration was achieved

through trainee practice and rotation, through apprenticeships, and through education projects addressing specific managerial issues related to IT. Highly situated programs do, however, run the risk of being conservative and they tend to create barriers for personal development. We found it useful to detach dedicated course activities from the IT organization to help the trainees think critically and develop new perspectives. This combination of situated and detached activities represents another fundamental dilemma involved in all learning processes: the experimenting versus the reflecting (Kolb 1984). On the practical level, we recommend that the resources available for educational activities be governed and protected by formal contractual arrangements to protect the trainee's from being overly engaged in practical activities.

In Ruohonen's case, the CEO was initially aware of a number of information processing and development problems and he contacted two external consultants to organize a project addressing these problems (Ruohonen 1990, 1991). The consultants organized the process as an integral part of the ongoing management of the organization and they used dedicated seminars and workshops to create better opportunities for the participants to learn about strategic information systems planning and think critically about the present use and management of IT in the organization. Compared to our case, the process was highly situated.

Stakeholders. Action learning is group oriented and it aims at transforming both individuals and organizations (Ballantyne *et al.* 1995). In our case, the training program was designed to support individual development and, as a side effect, to support organizational change. We attempted to accommodate different goals and we learned that expectations should be carefully adjusted and monitored both before and throughout the education. To avoid disappointment amongst trainees due to non-promotion after the education and also to increase the organizations benefits from training programs, we recommend to provide equal opportunities for trainees to pursue management and professional career patterns and to make the rewards and prestige of the two complementary career patterns similar. Management skills are highly useful in non-management positions, and IT organizations needs to have some of its most skilled and experienced members pursue professional rather than managerial careers (Benbasat *et al.* 1980; Shore 1983; Brooks 1987).

Ruohonen's case involved both business and IT managers. The process was designed to inform business managers about IT issues and to develop their understanding of how to include IT issues into their planning. In a similar way, IT managers were challenged to learn more about business needs. But the overall goal was not, in contrast to our case, to develop individual skills. It was to establish organization wide cooperation based on a shared information systems strategy (Ruohonen 1990, 1991).

5.2. Management attention

Management training programs are crossroads where organizational and individual agendas meet. They are initiated as a response to organizational issues and problems but enacted by individuals. To reconcile the two worlds one has to pay attention to side effects and to individual needs and behaviors. In our case, the program's symbolic aspects elucidates the discrepancy between top management's dispassionate, rational approach and the trainees' emotional, existentialist approach. Top management did not seem fully to have anticipated the expectations raised by the program. But it became aware of the side effects which enabled it in the next version of the program to lower the expectation that participation would lead to managerial positions. Management training programs cannot be regarded solely as empirical-rational change strategies (Chin *et al.* 1970). They must be treated as cultural-symbolic interventions (Ciborra *et al.* 1994; Borum 1995b) in order to support organizational learning and change. We recommend to use a symbolic perspective to foresee possible significations of a training program instead of simply relying on top management's responsiveness to side effects (Borum *et al.* 1997).

Further complications arise as IT organizations can be characterized as loosely coupled systems (Orton *et al.* 1990). First, top management with its economic and strategic preoccupation is largely de coupled from the core IT activities. Second, IT organizations comprise loosely coupled subcultures with operations and development as the dominant ones. Third, IT specialists are more attached to the IT field than to specific organizations. Finally, the continuously changing technology and business applications impose organizational changes—sometimes of a fundamental nature—as a prerequisite to organizational survival (see Borum *et al.* 1992; Borum 1995b). Training programs represent an opportunity for making

couplings more loose—for example detachment of trainees from the daily organization—and more tight—for example between top management and trainees and between different actors' ideas about present and future practices. This makes improvisation (Weick 1993) and exploration (March 1995) crucial ingredients of the management of training programs. We recommend management to: start up other parallel activities, which are loosely coupled to the training program; exploit information about the organization, the program, and the participants that is created as the process unfolds; reduce the risk for unwanted or dysfunctional effects; address defensive routines and actions evoked by the program; and exploit the unintended positive side effects and opportunities created.

In conclusion, our experiences and findings suggest action learning as a useful approach to develop appropriate managerial skills and attitudes as part of the ongoing transformation of IT organizations. But they also suggest that management's attention and willingness to improvise are prerequisites to successful exploitation of the strategy's potential as a change strategy that goes beyond individual learning.

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References

Andersen, I., F. Borum, P. H. Kristensen & P. Karnøe (1995): *On the Art of Doing Field Studies*. Copenhagen: Copenhagen Business School.

Argyris, C. (1970): *Intervention Theory and Method. A Behavioral Science View*. Reading, Massachusetts: Addison-Wesley.

Argyris, C. & D. A. Schön (1996): *Organizational Learning II*. Reading, Massachusetts: Addison Wesley.

Ballantyne, R., C. Bruce & J. Packer (1995): *Action Learning in Vocational Education and Training. Vol. 1: Theoretical background*. Chadstone, Australia: Report commissioned by the National Staff Development Committee.

Benbasat, I., A. S. Dexter & R. W. Mantha (1980): Impact of Organizational Maturity on Information System Skill Needs. *MIS Quarterly*, Vol. 4, No. 1 (21–34).

Borum, F., L. Mathiassen & J. Strandgaard Pedersen (1996): *Transforming IT Management through Action Learning.* Department of Computer Science, Aalborg University, Denmark.

Borum, F. (1995a): *Organization, Power, and Change.* Copenhagen: Handelshøjskolens Forlag.

Borum, F. (1995b): *Strategies for Organizational Change.* Copenhagen: Handelshøjskolens Forlag. (In Danish)

Borum, F., A. L. Friedman, M. Mønsted, J. Strandgaard Pedersen & M. Risberg (1992): *The Social Dynamics of the IT Field.* Berlin: DeGruyter.

Borum, F., L. Mathiassen & J. Strandgaard Pedersen (1997): *Links between Individual Learning and Organizational Change. Management Training in Practice.* Submitted for publication.

Brooks, F. P. (1987): No Silver Bullet. *Computer,* Vol. 20, No. 4 (10–19).

Brown, J. S. & P. Duguid (1991): Organizational Learning and Communities-of-Practice. Toward a Unified view of Working, Learning, and Innovation. *Organization Science,* Vol. 2, No. 1 (40–57).

Cash, J. I., F. W. McFarlan & J. L. McKenney (1992): *Corporate Information Systems Management—The Issues Facing Senior Management.* Third edition. Homewood, Illinois: Irwin.

Chin, R. & K. D. Benne (1970): General Strategies for Affecting Changes in Social Systems. (32–59) in W. G. Bennis *et al.* (Eds.): *The Planning of Change.* Bristol: Holt, Rinehart & Winston.

Ciborra, C. & G. F. Lanzara (1994): Formative Contexts and Information Technology. Understanding the Dynamics of Innovation in Organizations. *Accounting, Management, and Information Technology*, Vol. 4, No. 2.

Couger, J. D. (1988): Key Human Resource Issues in IS in the 1990's. *Proceedings of the Hawaii International Conference on Systems Sciences,* (162–170).

Dahlbom, B. & L. Mathiassen (1993): *Computers in Context. The Philosophy and Practice of Systems Design.* Cambridge, Massachusetts: Blackwell.

Earl, M. J. (1989): *Management Strategies for Information Technology.* Cambridge: Prentice-Hall.

Evans, R. (1982): *The Origins and Growth of Action Learning.* Lund: Studentlitteratur.

Humphrey, W. S. (1989): *Managing the Software Process.* Reading, Massachusetts: Addison Wesley.

Kolb, D. A. (1984): *Experimental Learning—Experiences as the Source of Learning and Development.* Englewood-Cliffs: Prentice-Hall.

March, J. G. (1995): *Reason and Change. Management in a World Enriched with Ambiguity.* Copenhagen: Samfundslitteratur. (In Danish)

Mathiassen, L. (1995): Control and Creativity in the IT-field. (127–156) in S. Hildebrandt *et al.* (Eds.): *Management II.* Copenhagen: Børsen. (In Danish)

Orton J. D. & K. E. Weick (1990): Loosely Coupled Systems. A Reconceptualization. *Academy of Management Review,* Vol. 15, No. 2 (203–223).

Ruohonen, M. (1990): Action Learning in Information Management Education. *Education & Computing,* Vol. 6, No. 1–2 (137–146).

Ruohonen, M. (1991): Information Management Education in Human Resource Strategy. *The International Journal of Information Management,* Vol. 11 (126–143).

Schein, E. K. (1985): *Organizational Culture and Leadership. A Dynamic View.* San Francisco: Jossey-Bass.

Schön, D. A. (1983): *The Reflective Practitioner. How Professionals Think in Action.* New York: Basic Books.

Schön, D. A. (1987): *Educating the Reflective Practitioner.* San Francisco: Jossey-Bass Publishers.

Shore, E. B. (1983): Reshaping the IS Organization. *MIS Quarterly,* Vol. 7, No. 4 (11–17).

Strandgaard Pedersen, J. (1991): *Continuity and Change: Cultural Perspectives on Organizational Change and Transformation in IT Firms.* Copenhagen: Samfundslitteratur.

Swanson, E. B. & C. M. Beath (1989): Reconstructing the Systems Development Organization. *MIS Quarterly,* Vol. 13, No. 3 (293–308).

VanMaanen, J. (1988): *Tales from the Field. On writing Ethnography.* Chicago: Chicago Press.

Weick, K. E.(1993): Organizational Redesign as Improvisation. (346–379) in G. P. Huber *et al.* (Eds.):*Organizational Change and Redesign.* New York & Oxford: Oxford University Press.

Yin, R. (1994): *Case Study Research.* Newburry Park, California: Sage Publications.

Appendix.

Below are the survey questions and results of the organizational evaluation of the program. The survey includes all trainees (20), their mentors (20) and a selection of organizational spectators (20) who did not participate in the

program, but experienced it as ordinary members of the IT unit. The survey was carried out via e-mail, and the response rate was 80% (48 out of 60).

1. How much have the education improved the trainees competence as active participants in the transformation and modernization of IT organizations?
2. To what extent has the competence of the trainees been utilized to transform and modernize the organizations IT activities?
3. To what extent do you expect the trainees competence to be utilized in the future transformation and modernization of the organizations IT activities?
4. How much has the education meant for your work and your personal professional development?
5. Which effect did the education have on other persons and activities?
6. How many organizational and cultural barriers prevent effective utilization of the trainees competence in transforming and modernizing the organizations IT activities?

Question	Answer	Trainees	Mentors	Spectators	Total
1	Many-some	16	14	7	37
	A few-none	1	1	7	9
	Total	17	15	14	46
2	Many-some	7	5	4	16
	A few-none	10	10	12	32
	Total	17	15	16	48
3	Many-some	10	14	7	31
	A few-none	6	1	8	15
	Total	16	15	15	46
4	Many-some	14	12	2	28
	A few-none	3	3	13	19
	Total	17	15	15	47
5	Many-some	7	10	8	25
	A few-none	9	5	8	22
	Total	16	15	16	47
6	Many-some	14	3	9	26
	A few-none	3	12	5	20
	Total	17	15	14	46