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PROJECT-BASED LEARNING IN PROFESSIONAL ORGANIZATIONS

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ABSTRACT

This study describes a method of project-based learning applicable in work organizations. The essence of this method lies in the connection of learning and working in group projects, fine-tuned to the needs of the participants and to the possibilities offered by the organization. The method is conceptually underpinned by the learning-network theory. Following an overview of the characteristics of the project-based learning method, a comparison is made with other action-based methods. An empirical illustration is provided by a discussion of four learning projects conducted in regional probation institutions, which are found to differ from each other in several respects. It is concluded that the project-based learning method can yield a surplus value compared to more traditional types of education and training. It also makes higher demands, however, on the learning and work systems of the organization and on the involvement of the learners.

Work is an important context for adult learning, and learning in the context of work can take various shapes. Training provides learning experiences that are structured by professional educators, while learning from everyday work situations can be more or less meaningful depending on the learning potential offered by the job. The advantage of formal training is its efficiency in transferring clear-cut knowledge and skills. The problem with formal training is that its usefulness may be limited to well-defined qualification needs. Work-based learning in everyday situations, on the other hand, has the advantage of being adaptive, just-in-time, and meaningful to employees. The problem is that it is hard to systematize these work-related learning situations into a coherent set of activities. In other words, there is not necessarily an articulated methodology (Selener, 1996). A well-balanced method of project-based learning could overcome the disadvantages of both formal training and unstructured everyday learning while capitalizing on their strengths.

Defining Project-based Learning

What does project-based learning in organizations involve? The key to this question lies in establishing a proper connection between work and learning. This study describes some experiences with a method of project-based learning in organizations. The method is action-based and focuses on tailoring the links between learning and work (Van der Krogt & Warmerdam, 1993). Before describing our practical experiences with the project-based learning method, we will describe its main principles.

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Phasing the learning path

Within project-based learning, organizing the learning path encompasses three phases: (a) a diagnosis of existing conditions, developments, and problems; (b) data feedback and the formulation of learning themes; and, (c) the organization of one or more learning projects. Although we refer to these three interrelated activities as phases, in practice they need not always be strictly separated in time.

The first step entails an exploration of existing policy developments and performance problems within the organization. Simultaneously, an investigation is made into the available opportunities for and impediments to learning activities. These investigations are carried out by analyzing reports and interviewing key informants in the organization. The diagnosis is aimed at finding starting points for the form and content of the learning projects to be conducted. Core questions are: What should be learned? How should it be learned? The diagnosis results in a picture of the work system (including perceived problems and developments) and the learning system (including formal and informal elements). It also provides insight into the ideas and interests of relevant actors in the organization.

The data are subsequently assimilated into a brief written report and shared with the organization. This report discusses subjects such as the structure of the organization, basic external and internal developments, focal points in management strategies, learning opportunities and impediments encountered in the organization, learning needs of the participants, and their ideas on framing the learning project. It also contains recommendations for themes that might be suitable for learning projects. The report is discussed at a meeting with members of the organization to check for accuracy and to define specific themes for learning projects. The themes will ultimately be chosen by the participants themselves.

The next step consists of organizing one or more group learning projects. A learning project involves: (a) a learning group which involves a number of employees who are prepared to conduct a range of learning activities together; (b) a learning theme representing an issue relevant to the daily work of the participants about which they want to learn; and (c) a set of learning activities, taking place both in formal and informal settings.

The participants decide for themselves how the project should be set up, which learning activities will be conducted, and who should undertake them. These decisions can be specified in a project plan. The plan describes the central theme of the learning activities as well as the learning objectives defined by the participants. In addition, the project plan may indicate which learning settings will be addressed, both formal and informal.

Connecting learning with work

Much more than in traditional training programs, the project-based learning method attempts to provide connections between learning and work. Five types of connections can be distinguished.

First, the learning activities are centered around a theme with actual relevance to the organization. This may be a work-related problem, an organizational problem, or an evaluation of existing work practices or policies. It may also bear on a new policy

initiative which is not problematic in itself but must be dealt with on short notice. It is essential to select a theme with which the project participants have to cope in their daily work.

Second, the learning project is aimed at connecting formal learning settings off the job with informal learning settings on the job. Employees can learn in formalized training programs, but also, and often predominantly, from their work experience on the job. These informal learning processes take place when employees experiment with a new work method, carry out a difficult task, consult colleagues about work problems, take part in supervision sessions with tutors, or evaluate policy activities. Within the thematic framework of the learning project, these activities can be combined with formal learning activities into a coherent set.

Third, learning projects also combine individual and collective learning activities at work. The primary aim of the learning project is for individual participants to acquire new qualifications that enable them to improve professional performance. Acquiring such qualifications, however, is not exclusively a process that each participant experiences individually or separately from work. A learning project offers participants many opportunities for group learning at work through the exchange of insights, experiences, and opinions. This can be achieved with other participants and with nonparticipants, such as colleagues from other departments, colleagues from similar organizations, and experts from outside the organization. In learning group sessions, the participants reflect on the learning activities conducted and their contribution to a new understanding of the core theme.

Fourth, the method attempts to establish a link between the learning system and the organization of work. On the one hand, a learning project will be much more deeply embedded in the normal work organization than an external course. It will also create more favorable conditions for input from practice and for the application of acquired knowledge in practice. On the other hand, the learning project is not embedded in the organization to such an extent that there is a danger of other policy priorities putting too much pressure on the learning activities. The latter often happens in traditional on-the-job training.

Finally, the project-based learning method aims to combine the individual acquisition of new qualifications with the improvement of work in the organization. The underlying principle of this is learning-by-doing, or extending the individual action repertoire by collectively solving real-life work problems. An organization that gradually develops learning projects tailored to its own structural and cultural conditions will thereby enable its employees to be constantly responsive to new developments in their work.

Theoretical Underpinnings of the Project-based Learning Method

The project-based learning method is action-based, in that it focuses on broadening the action repertoire of the participants through engagement in concrete work-based learning activities supplemented by group reflection. In this respect, there are clear parallels with action-based learning methods, such as action learning (McGill & Beaty, 1992; Revans, 1980), action research (Cunningham, 1993), action-reflection learning (Marsick & Watkins, 1990), and organizational learning through inquiry and

dialogue (Argyris & Schön, 1978). Before examining some practical experiences, we will compare our method with these action-based learning methods. This results in a theoretical framework for the project-based learning method based on a network perspective (Van der Krogt, 1995, 1998; Van der Krogt & Warmerdam, 1997).

Action-based learning methods

A common characteristic of all action-based learning methods is their orientation towards changing people or their organizations. The methods may vary with respect to their emphasis on action or reflection, and regarding their focus on self-direction or intervention by a facilitator (Watkins & Brooks, 1994). Figure 1 provides an overview.

Figure 1. A comparison of action-based learning methods.

The action-learning sets described by McGill and Beaty (1992), who draw on the work of Revans (1980), are focused on learning-by-doing, whereas Marsick and Watkins (1990) add a specific reflection component to the learning sets. The working principles of these sets are similar, in that a group of managers is assisted by a set facilitator in solving the real-life problems confronting each of them individually or collectively. The group context is used as a means of sharing experiences and challenging individually-held assumptions. The facilitator normally acts as a learning coach to help the group members interpret their actions in new ways (Brookfield, 1986). A diagnosis of the problem is usually part of the activities, but the main focus is on action. In action research, much more attention is paid to a repeated diagnosis of the participants' situation and the occurring changes (Cunningham, 1993). The information gained is used to develop an organizational development plan specifying the

activities to be undertaken by the participants. The facilitator plays an important role as the researcher guiding data collection and analysis. Reflection on the problematic situation of the participants is emphasized in this method, a process which is even more central to organizational learning through inquiry and dialogue (Argyris & Schön, 1978). The facilitator helps a group of people become aware of unchallenged theories guiding their actions, so the mechanisms underlying work performance are analyzed. Group reflection is stressed by engaging in inquiry and dialogue about people's actions in concrete work situations. Development plans are created to change people's assumptions and, hence, their actions.

Elements of the action-based learning methods are found in the method of project-based learning, but the latter differs from the former ones in several respects. Figure 1 indicates that project-based learning tries to balance action and reflection, as well as self-direction and facilitator intervention. From this perspective, it more strongly resembles the action-reflection learning method described by Marsick and Watkins (1990). Inquiry and dialogue, questioning assumptions, and diagnosis are important elements in project-based learning, but only in conjunction with actual work improvement by the participants themselves. What exactly is it that needs inquiry or questioning? The method of project-based learning takes into account distinct elements of the learning context. Specifically, these include the way work is organized, the existing learning system, and the ideas and interests of those involved. Action-based learning methods, on the other hand, seem almost context-independent in this respect. They use a particular set of learning strategies and beliefs, regardless of the specific work and learning context in the organization.

The notion that some types of work offer more possibilities for learning than other types is a crucial one not often found in the action-learning literature. For instance, individual Tayloristic work offers fewer and different learning opportunities than managerial jobs in which people have frequent interactions. Unlike the action-based learning methods, the method of project-based learning focuses explicitly on organizing links between learning and work improvement, through constant reflection-in-action (Schön, 1983). In addition, the method of project-based learning assumes that different actors prefer different strategies in organizing learning and improving work. Learning projects can be regarded as frames of interaction between the actors striving to secure their interests in the field of learning and work. The power play is an essential feature of the project-based learning method, one not explicitly addressed in action-based learning methods.

A network perspective on the project-based learning method

The method of project-based learning employs a network perspective. The learning network theory (Van der Krogt, 1995, 1998; Van der Krogt & Warmerdam, 1997) assumes a relation between the learning network and the labor network of an organization. Actors play an important role in the learning and labor networks. The participants in the learning network, such as trainers and employees, are called learning actors. Because most learning actors also participate in the labor network, there is a relationship between the learning and the labor network. Work actors include managers, employees, and trade unions. Learning and work actors influence the networks in which they operate on the basis of the positions and action theories they hold.

They interact with each other to develop learning programs, policies, and activities. Actors have learned from their actions, and from the reflection on the learning group's (inter-)actions, when their theories-of-action have changed (Argyris & Schön, 1978). The interactions gradually become institutionalized in certain structural arrangements, regarding the content and the organization of learning programs, and the learning climate. In turn, these learning structures influence the opportunities of actors to participate in the labor and learning networks. Figure 2 gives an overview of the way in which the learning network operates.

Figure 2. The learning network of an organization.

The learning network theory further assumes that learning networks can be organized in different ways. In order to describe the differences in learning networks, four theoretical types are proposed. In a *liberal* learning network, individual learners organize their own learning process and create their own learning programs. They decide what they want to learn and organize a loosely coupled network of people to help them achieve it. The learners manage the coordination and control of learning. The learning program consists of individual activities and is relatively unstructured. In the *vertical* learning network, centralization and hierarchy play an important role in the coordination and control of learning. The management and educators of the organization draw up policy plans, design learning programs and supervise the learners. The learning program is linearly planned and function-oriented. In the *horizontal* network, learning groups play an important role. They develop learning programs together incrementally. In these cooperative activities, a lot of attention is given to the development of shared norms and views on learning. The learning program is problem-oriented and integrated with daily work. In the *external* learning network, actors outside the organization are crucial. External inspiration (e.g., from the scientific community or a professional association) has a great impact on this learning network. Outside actors can introduce new scientific knowledge (e.g., a new working method) into the organization and influence the way inside actors learn about it. The learning program is externally coordinated and profession-oriented. An overview of the four theoretical types of learning networks is provided in Table 1.

For the purpose of this study, we regard learning projects as small learning networks on the group level (Poell & Van der Krogt, 1997; Poell, Van der Krogt, & Wildemeersch, 1998). This perspective enables us to describe the action theories, processes, and structures as they develop in actual learning projects. It also enables us to distinguish between four different theoretical types of learning projects that can be organized. We will apply these insights to some practical experiences with the method of project-based learning below.

Table 1
Four theoretical types of learning networks

	Liberal learning network	Vertical learning network	Horizontal learning network	External learning network
Dominant actor	individual learners	managers and trainers	learners as a group	professional associations outside
Organization of learning processes	isolated activities	linear planning	organic	externally coordinated
Content structure (profile)	unstructured	task or function oriented	problem or organization oriented	profession oriented
Organizational structure	loosely coupled	centralized	integrated	externally inspired

An Empirical Illustration of the Project-based Learning Method

In order to demonstrate the effect of the project-based learning method in practice, we will describe some experiences with projects carried out in Dutch probation institutions. Practical experiments were set up in four institutions more or less characteristic of the field. The focus was on the management team of each organization and the work problems they encountered. In all four cases, external consultants were called upon to make a diagnosis of the learning network and the labor network of the institution. They managed data feedback to the participants and acted as group counselors during the learning projects that followed. They also assisted the group in evaluating the impact of their learning projects.

Diagnosis and Data Feedback

Table 2 provides an overview of the diagnostic, feedback, and learning-project phases in each of the four cases. We will describe and analyze the four experiments in more detail below.

Diagnosis of networks and action theories

The consultants started with a thorough diagnosis of the four organizations and current developments in the field of probation. The focus was on the organization of the work of the management team, on the way their learning was organized, and on their ideas about learning and work in the probation institutions. The diagnosis was carried out by studying policy documents and interviewing core actors.

The organization of work of all four management teams (referred to as the labor network) was found to be fairly autonomous in nature, offering the managers ample opportunities to self-direct experiments. The management team in two institutions ("Fire" and "Earth") turned out to be mostly oriented towards work content issues, such as the introduction of new working methods for probation officers. The work action-theories of the managers in the other two institutions ("Air" and "Water") were found to focus on work organization issues, such as internal communication.

The learning network in all four institutions was deemed problem-oriented in nature, meaning that learning-by-doing and self-directed problem solving are crucial elements in the way the managers usually learn. The learning network in Fire was also characterized by a task orientation, in that the institution employs a staff member taking care of more or less standardized learning programs for the organization. The learning action theories of the consultants (as core actors in the learning network) were oriented towards having the participants self-direct their learning and integrate it with solving daily work problems. Although no explicit diagnosis was made of the learning action-theories of the management team members, in Fire and Air they were found to parallel the consultants' ideas. In Earth, the managers viewed learning as undertaking organizational change efforts under process guidance by the consultants, while Water saw the managers expressing a need for a formal management training course. The diagnosis data are displayed in the upper part of Table 2.

Data feedback and articulation of learning themes

The consultants wrote a report containing their findings for each institution, which was discussed in a meeting with the participants. The report encompassed the diagnostic data about the labor and learning networks and the action theories of the actors. In three institutions, the consultants' interpretations encountered approval, but the managers in Water expressed their disapproval about the consultants' ideas. In the latter case, a feedback session was used to adjust the diagnosis into a shared image of the institution's situation and needs.

Each report also contained suggestions by the consultants for learning themes. In order to have the upcoming projects add new elements to the organization, the consultants suggested themes deemed relevant but receiving little attention in the management policy. For instance, an institution primarily focused on work content issues was advised to elaborate themes concerned with work organization, and vice versa. The feedback sessions served as a platform for the generation of more specific ideas for learning project themes on the basis of the consultants' suggestions.

The feedback sessions ended with a substantial view of the kind of group learning projects that the participants were going to carry out, as well as the possibilities the organization could offer them in terms of learning potential. The feedback data are displayed in the middle of Table 2.

Table 2

The diagnostic, feedback, and learning-project phases in four experiments with probation institutions

Learning network	“Working in projects” (Fire)	“Implementing alternative sanctions” (Air) DIAGNOSIS	“Improving decision making” (Earth)	“Improving internal communication” (Water)
	<i>task and problem oriented:</i> learning by doing, explicit reflection, structured work development projects	<i>mainly problem oriented:</i> learning by doing and explicit reflection	<i>mainly problem oriented:</i> learning by doing	<i>mainly problem oriented:</i> learning by doing
Action theories of actors in the learning network	<i>consultants’ theories:</i> self- directed learning integrated with daily work; <i>participants’ theories:</i> no explicit diagnosis - turned out to be self-directed learning integrated with daily work	<i>consultants’ theories:</i> self- directed learning integrated with daily work; <i>Participants’ theories:</i> no explicit diagnosis - turned out to be “self-directed learning integrated with daily work”	<i>consultants’ theories:</i> self- directed learning integrated with daily work; <i>Participants’ theories:</i> no explicit diagnosis - turned out to be having consultants counsel organizational change efforts	<i>consultants’ theories:</i> self- directed learning integrated with daily work; <i>Participants’ theories:</i> no explicit diagnosis - turned out to be receiving structured management training
Labor network	<i>semi-autonomous</i> work in management	<i>semi-autonomous</i> work in management	<i>semi-autonomous</i> work in management	<i>semi-autonomous</i> work in management
Action theories of actors in the labor network (participants)	focused on work <i>content</i> and the development of work <i>methods</i>	focused on the <i>organization</i> of work	focused on work <i>content</i>	focused on the <i>organization</i> of work
feedback of diagnostic data into organization	learning group meeting to discuss consultants’ findings; general approval; consultants suggest learning themes concerned with the organization of work	FEEDBACK learning group meeting to discuss consultants’ findings; general approval; consultants suggest learning themes concerned with the work content	learning group meeting to discuss consultants’ findings; general approval; consultants suggest learning themes concerned with the organization of work	learning group meeting to discuss consultants’ findings; general <i>disapproval</i> ; consultants suggest learning themes concerned with the work content

Table 2, continued

	"Working in projects" (Fire)	"Implementing alternative sanctions" (Air)	"Improving decision making" (Earth)	"Improving internal communication" (Water)
ACTORS	1 executive, 1 staff member, 3 team leaders	2 executives, 4 team leaders	2 executives, 3 team leaders	1 executive, 1 staff member, 4 team leaders
PROCESSES				
Development of the learning program	participants create their own learning program, helped by consultants	participants create their own learning program, helped by consultants	participants use consultants to create a learning program encompassing organizational change	consultants design a training program for participants
Conducting learning activities	participants engage in learning activities, coached by consultants	participants engage in learning activities, coached by consultants	participants change organization, guided by consultants	participants enroll in training program, designed by consultants
Shaping a learning policy	participants make a learning-project plan, discuss it with consultants	participants make a learning-project plan, discuss it with consultants	consultants advise participants in making an organizational change plan	participants decide they need a training course
STRUCTURES				
Content structure (global orientation; learning situations)	<i>problem and profession oriented</i> : literature study; learning-by-doing; reflection on experiences; inviting external experts; training	<i>profession oriented</i> : literature study; learning- by-doing; inviting external experts; training	<i>profession and problem oriented</i> : literature study; discussion; learning-by- doing; reflection on experiences; consultation by external experts; training	<i>function oriented</i> : a management training course including case reflection and sessions with external experts
Organizational structure	<i>horizontal, egalitarian</i> : participants decide, consultants monitor learning processes integrated	<i>external, professional</i> : participants decide, consultants provide external inspiration innovative	<i>external, professional</i> : participants decide, consultants provide external guidance innovative	<i>centralized, formalized</i> : consultants design training program, participants enroll
Learning climate				regulated
TYPE OF LEARNING PROJECT	horizontal-external	external	external-horizontal	vertical

The Learning Projects

At this stage, the four institutions determined their process of setting up learning projects. This resulted in four different cases, which will be detailed below.

Working in projects: the Fire learning project

Four managers and one staff member formed a learning group devoted to developing a specific method of project-based work. Within the context of this joint goal, all participants formulated individual learning objectives. The group wanted to develop a working model that might serve as a common reference point for all units within the institution. To achieve this, they developed a program containing various learning activities, such as studying a handbook together; examining earlier projects in the institution; having an external expert critically examine both the model and current practice; training and practicing setting up an imaginary project under supervision of an external expert; and formulating a new model. The consultants coached participants in the development of this program. The working relationship among the consultants and participants was fairly egalitarian, reflected in a joint responsibility for organizing the learning project. All involved were satisfied with these arrangements.

Implementing alternative sanctions: the Air learning project

Six managers took part in this learning group, organized around the issue of alternative sanctioning by probation institutions. As with the Fire institution, participants made all relevant decisions in this learning project, while seeking additional external inspiration from the consultants. Learning situations were connected to the conception and continuous adaptation of a strategic plan for the institution by the participants, with reliance on self-reflection and evaluation of learning along the way. Additional external inspiration was sought from studying recent literature on alternative sanctioning. In this way, the group learned new insights from the professional field of probation institutions. The consultants were asked to provide ideas for learning activities in the daily work situation and frames of reference to monitor the learning progress of participants. Both the participants and the consultants were pleased with the learning progress.

Improving decision making: the Earth learning project

Five managers participated in this learning group, which focused on changes in the internal organization of the institution. A consultant was asked to guide a decision-making process with the participants by organizing group discussion, reflection, consultation, and encouraging self-study. Due to their heavy daily work load, participants did not always find time to reflect systematically on their own functioning at work. The consultant acted more or less as an advisor or counselor for the participants in setting up an organizational change plan, which was later implemented. The learning that took place focused on the participants' increasing organizational awareness. Although the consultants had to accept a different kind of learning project than they intended, the participants were content with the way the counseling program turned out for them.

Improving internal communication: the Water learning project

This learning group, aimed at improving the internal communication in the institution, consisted of five managers and one staff member. They demanded that the consultants provide a more structured approach than open project-based learning. This finally resulted in a traditional two-day management training program, focused on improving some instrumental skills of the participants. The program encompassed training methods such as video-training, case discussions, and role-play. The training was delivered by a professional management trainer. Contrary to the other three cases, no additional learning activities in daily work were part of this learning project. The relationship between the consultant and the participants was more centralized in the "Water" organization than in the other cases. Although it was necessary to develop consistency between the learning action theories of the consultants and the participants, the resulting learning project suited the needs of the participants.

Comparing the cases

Learning projects can be organized in various ways, as the lower part of Table 2 illustrates. The four cases turned out differently with respect to the action theories of the participants, the interaction processes in the projects, and the structures that resulted from the interactions. In all cases, the method was effective in the sense that the participants could relate to the arrangements that resulted from the diagnostic and data feedback stage. Although some groups (notably Earth and Water) did not comply to the open project model suggested by the consultants, the methods were tailored to the participants' needs and the organization's possibilities. Using terms from the learning-network theory, the Fire case can be interpreted as a horizontal-external learning project, Air as external, Earth as an external-horizontal hybrid, and Water as a vertical learning project.

Discussion

Using the learning-network theory to interpret the practical experiences, we are able to draw some conclusions regarding the method of project-based learning. First, even if the diagnostic and data feedback phase are carried out similarly in various settings, the resulting learning projects can come out very differently (Table 2). Second, despite these differences, each of these learning projects can be fairly effective to the participants and the consultants. And third, the reason for this success seems to be that each project is geared to the participants' interests and the possibilities offered by their organizations, as diagnosed in the first phase of the method. These conclusions are elaborated below.

The Effectiveness of Different Learning Projects

The impact of the practical experiments was assessed by the participants and the consultants through the completion of a twelve-question evaluation form focusing on the learning process and outcomes. The answers were compared and discussed in a final meeting with each learning group. The method of project-based learning was considered effective primarily because a combination of an open approach with the use of diagnostic data allowed for tailored arrangements. Some elements were

common to all cases, namely:

1. Learning activities were centered around work problems;
2. The possibilities for learning within the organization were recognized, exploited, and increased;
3. Informal learning settings on the job were connected with more formal learning settings off the job;
4. The participants made most decisions with respect to their learning project, including in one case the possibility of enrolling in traditional management training; and
5. The consultants advised the participants and made sure there was a balanced combination of supervision and self-supervision in defining the learning objectives; recognizing, using, and connecting the learning settings; developing the learning path; and in applying the newly acquired knowledge and skills in practice.

Despite these common features, the actual learning projects were very different from each other. Three of the cases were characterized by significant input from the participants' professional discipline, while two of those also featured problem-based organization-specific (horizontal) elements. The fourth case was entirely different, in that the (vertical) training arrangements were much more formalized and centralized. The notion that work-related learning projects can be organized in various ways, all of which can be considered more or less effective by the participants and the consultants, is a prime conclusion in this study.

The added value of applying the learning-network theory to the learning-project method is that it enables us to make these distinctions (Figure 2). From the beginning to the end of an experiment, the consultants and the participants are able to frame the existing conditions and their experiences as they occur. The learning-network theory thus becomes a useful frame of reference in the learning-project method.

Taking Work Systems and Action Theories Into Account

A first lesson learned is to avoid "one-best-way" thinking in project-based learning. Learning arrangements in organizations are always embedded in work context. Work systems differ substantially with respect to the content of the work processes, the social relations at work and the conceptions of the dominant work actors (Mintzberg, 1979; Van der Krogt & Warmerdam, 1994). Therefore, work systems also vary with respect to opportunities for learning. These differences in work systems have to be taken into account for a tailored approach.

Even if differences in work systems are accounted for, learning projects do not always run smoothly. For some participants, it is difficult to benefit from a relatively open learning context. They are not used to this way of learning. Many of them deploy rather traditional conceptions of learning in the work context. Based on this finding, two of the four institutions were able to adequately apply the method, but the other two had to make adjustments. It appears, therefore, that learning projects require certain conditions in order to become effective. Additional conditions are required on three levels:

1. The organization must offer sufficient space for their staff to distance themselves from the pressures of daily work, and it must provide sufficient means to facilitate protracted and in-depth learning projects;

2. The participants in the project must recognize the necessity of investing time and effort in the project and they must be prepared to do so; they should also be able to supervise and steer their own learning process; and

3. When necessary, provisions must be made for adequate guidance, particularly when learning objectives are made explicit, when learning settings are developed and connected, and when newly acquired knowledge and skills are put into practice.

If these conditions cannot, or not sufficiently, be fulfilled, it is advisable to opt for more structured learning programs that involve steering by an educator. The diagnostic phase is crucial in clarifying these matters for the parties concerned. By discussing diagnostic data about the learning network, the labor network, and the actors' action theories, the participants and the consultants can develop learning projects that are fine-tuned to their context, but also add new elements to them. The learning-network theory provides a useful frame of reference for discussion, reflection, and action in project learning.

Implications for further research

This study demonstrates, both from a theoretical and an empirical perspective, the crucial importance of the action theories of core actors in the organization of learning projects. Further research is needed into the content of the learning action theories of employees, managers, and educators. What are their mental models with regard to the organization of learning processes? The strategies that these actors employ to transfer their theories into action when they interact with other actors, and the differential role that their power base plays in these interaction processes, makes another line of research that needs to be pursued. More attention should be devoted to measuring the impact of different learning-project approaches that groups may choose to take. Some empirical work in this area has been conducted by Poell (1997), who concluded that different actors use different criteria to assess learning-project effectiveness. These differences should be made more explicit.

This study also points to the importance of the work context in the organization of learning projects. The practical experiences with project learning described above took place in professional organizations only. The work in this organizational type is characterized by a fair amount of employee autonomy and, hence, learning potential. The method's applicability and effectiveness in other kinds of organizations, for instance machine bureaucracies or simple structures (Mintzberg, 1979), remain open for research. It is our belief that the basic principles of taking into account the existing learning and labor networks, as well as the action theories of core actors, apply in other organizational types as they do in professional contexts. The learning-network theory would, however, expect the kind of learning projects that result from the diagnostic and feedback phases to differ from the ones described in this study.

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