Communities of practice as stimulating forces for collective learning

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Abstract

Purpose – The purpose of this research is to get a clear view on how can we judge groups in relation to the characteristics of a community of practice (CoP), and the presence of collective learning in these groups.

Design/methodology/approach – A review of literature on collective learning and CoPs led to the development of a conceptual model, which was tested through case study research against empirical data from three groups in organizations.

Findings – The groups differed concerning group characteristics, but also concerning the collective learning processes and learning outcomes present. The group that can be characterized as a CoP learns a lot, but the (learning) processes in the group are not always in favour of the organizational learning process.

Research limitations/implications – The conceptual framework was helpful to evaluate the characteristics of CoPs in relation to collective learning. These findings suggest that it will be interesting to expand the model, for example with consideration to the way CoPs experience the need to change.

Practical implications – The developed framework might help managers to judge if groups in an organization have characteristics of a CoP, if they are in balance and what might be needed to develop towards an ideal CoP with a great learning potential.

Originality/value – A first attempt is made to build a framework for judging CoPs for several aspects of their functioning. The research also shows that CoPs are not always stimulating forces for organizational learning.

Keywords Learning, Knowledge sharing, Group work

Paper type Research paper

Introduction

In today's world, organizations have to learn constantly, in order to respond flexibly to changes in the environment and to stay competitive. For becoming or sustaining a

learning organization, management has the task to make the best possible use of the knowledge of the workers in the organization, as it is the human capital that holds the most valuable potential for organizational learning (De Laat and Simons, 2002; Simons and Ruijters, 2001).

There is a growing consensus that the best way to improve organizational learning is not to (simply) focus on capturing, codifying and documenting knowledge of individuals, but rather to concentrate on ways through which knowledge can be shared, discussed and innovated. With the shift of attention to work-related learning, informal ways of learning have also increased in value in the opinion of educational researchers as well as HRD-practitioners (Bolhuis and Simons, 2003; Eraut, 2000). The problem is that those implicit or informal learning processes are difficult to detect, because people do not consciously recall and perceive this learning, and it is difficult to evaluate the outcomes. Implicit learning often results in tacit knowledge, which is context-specific, personal and difficult to communicate. Tacit knowledge nevertheless can be very powerful in learning and innovation processes (Nonaka and Takeuchi, 1995). In order to see what is learned so that one can share and evaluate it, it is important that tacit knowledge is made explicit. By doing so, knowledge becomes available and negotiable for others, a kind of social experience.

Several scholars have addressed the importance of groups where workers can share and develop knowledge together in or about their professional practice. The theory on communities of practice (CoPs) is a known example of this. Lave and Wenger (1991, p. 98) defined a CoP as "... a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping CoPs". Later Wenger extended this idea and defined CoPs as groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, 1998).

In the last few years, the term CoP has been extended to encompass new meanings that were not part of Lave and Wenger's original idea (Hildreth *et al.*, 2000). As Bood and Coenders (2004) argue, one can speak of a paradox. Lave and Wenger (1991) describe CoPs as groups that develop and act through self-organization – CoPs are groups that emerge naturally. A lot of organizations, however, create CoPs as a knowledge management tool to support or stimulate learning in the organization. Indeed, CoPs are commonly used and appear in several types and varieties to enhance knowledge exchange and organizational learning. And the term CoP is applied to a wide range of groups, from project teams to functional departments. The question could be raised to what extent these (intentionally created) groups actually are CoPs.

There is however no diagnostic or management instrument available, yet, that enables making judgements about the actual functioning of groups as a CoP. In this article, a first attempt will be made to build a framework that helps judging groups for several aspects of their functioning. We will report research that aims at providing insight in the way CoPs function by framing CoPs as described in literature and compare this to case study insights of groups of workers as they act in practice. The following research question is leading: what are the characteristics of communities of practice, and when are they stimulating for collective learning?

The learning taking place within groups will be evaluated by examining what characteristics of CoPs these groups have, how they learn collectively and what mechanisms stimulate or hinder learning. Although it is recognized that all learning

involves the level of the individual at some point, the research presented in this article focuses on the collective learning processes in these groups, since collective learning is seen as a strong mechanism for organizational learning (Dixon, 1999; Nonaka and Takeuchi, 1995). After presenting the research, the framework as used in the study will be discussed for its potential usefulness for managers to facilitate groups in their organization towards CoPs structures that stimulate organizational learning.

Theoretical framework
Characteristics of CoPs
Wenger (1998) states that members of a community are informally bound by what they do together and by what they have learned through their mutual engagement in these activities. The shared activities are embedded in a historical and social context that gives structure and meaning to what we do. These people do not necessarily work together every day, but they meet regularly because they find value in their interactions. With this, CoPs develop their own mini-culture consisting of own practices, routines, rituals, artifacts, symbols, stories and histories.

Wenger (1998) argues that, despite the variety of forms that CoP take, they all share a basic structure. A CoP can be viewed as a unique combination of three fundamental elements: a domain of knowledge, which defines a set of issues, creates a common ground and a sense of common identity; a community of people who foster interactions and relationships based on mutual respect and trust, and who care about this domain; and a shared practice they are developing with a set of frameworks, ideas, tools, information, styles, language, stories, and documents that community members share, and with that they can be effective in their domain. According to Wenger *et al.* (2002), these elements, when functioning well together, make a CoP an ideal knowledge structure – a social structure that can assume responsibility for developing and sharing knowledge.

CoPs fulfill a number of functions with respect to the creation, accumulation, and diffusion of knowledge in an organization (Wenger *et al.*, 2002). They are nodes for the exchange and interpretation of information. Because members have a shared understanding, they know what is relevant to communicate and how to present information in useful ways. They can retain knowledge in "living" ways, unlike a database or a manual, by preserving the tacit aspects of knowledge. They steward competencies and keep the organization at the cutting edge. Members of these groups discuss novel ideas, work together on problems, and keep up with developments inside and outside a firm. They provide homes for identities. Identity helps to sort out what we pay attention to, what we participate in, and what we stay away from. Having a sense of identity also entails a sense of belonging.

Although Wenger describes a group structure that should be stimulating for learning, another point of view is worth to describe. Wenger (1998) shows how workers organize their lives with their immediate colleagues and customers in CoPs to get their jobs done, and how within this community the rules of the working game are set: how to do the job and how to do it more efficiently. When these rules about performing a practice are the core business of a CoP, one might expect however that a CoP is reluctant about changing the way things are done in the group, or the practice they work in. We might expect that the CoP does not allow for adaptation that results in radical change of the routines in the group (see also Hoeve *et al.*, 2003). Therefore, we

should take into account the notion that CoPs are by nature conservative and therefore obstruct innovation or organizational learning.

Collective learning and knowledge creation
When researching the way CoPs learn and how they contribute to organizational learning, it is interesting to investigate the collective learning in the group, in relation to collective knowledge creation (Dixon, 1999; Nonaka and Takeuchi, 1995). Collective learning can improve the work and the processes of innovation, the adaptations to the changing environment and can optimize the learning of individuals. Nonaka and Takeuchi (1995) describe a collective learning process with a knowledge creation cycle. Knowledge creation is defined as the process whereby individuals and groups within a company and between companies share tacit and explicit knowledge; create concepts, justify these concepts, create prototypes, products and services based on the outcome of these justifications; and finally cross-level knowledge to other groups, departments, and firms. Creating new knowledge is not simply a matter of learning from others or acquiring knowledge from the outside. It has to be built on its own, frequently requiring intensive and laborious interaction among members of the organization and as a result a shared understanding or meaning about the knowledge that is created has to be developed. Nonaka and Takeuchi (1995) emphasize that the key to knowledge creation lies in the mobilization and conversion of tacit knowledge. This process takes place within an expanding "community of interaction", and through four modes of knowledge conversion:

(1) from tacit to tacit knowledge, defined as socialization;
(2) from tacit to explicit knowledge, defined as externalization;
(3) from explicit to explicit knowledge, defined as combination; and
(4) from explicit to tacit knowledge, defined as internalization.

Externalization is of particular importance when researching collective learning. In this process, people learn explicit from each other. Making tacit knowledge explicit generates group learning, because it leads to new insights and new knowledge in the group. Moreover, it reduces the risk that knowledge disappears when people leave the organization (Hildreth *et al.*, 2000).

A review of literature indicates that four processes can be discerned as important elements for defining the content of the concept "externalization". First, Brown and Duguid (1996) argue that tacit knowledge can only be externalized and spread through social interaction. Creating new knowledge collectively has to be built on its own, frequently requiring intensive and laborious interaction among members of the organization. More specifically, several authors describe the role of story telling or narratives for converting tacit knowledge into explicit knowledge (for example, Linde, 2001; Simons and Ruijters, 2001; Brown and Duguid, 1996). Story telling is a group process. The hearers are usually not passive consumers, but agree or disagree and add their opinion and knowledge to the story told (Linde, 2001). Next to this, the importance of collective reflection is emphasized (Simons and Ruijters, 2001; Nonaka and Takeuchi, 1995; Van Woerkom, 2003). According to Van Woerkom (2003), externalization can be defined as the process of collective reflection on experiences and interaction between individuals. This process involves individuals who are

attempting to conceptualize an image by expressing its essence in language, often using metaphors or analogies. This results in a creative process where new explicit knowledge is created. Finally, Brown and Duguid (1996) give in their article on the work of reps an interesting reflection on learning through the collective process of problem solving. Similar to the element of story telling, during the problem solving process the members of the group tell each other experiences, reflect on things that are done and discuss and exchange knowledge together.

Collective learning outcomes

De Laat and Simons (2002) argue that there is a difference between learning in social interaction – where there are individual learning outcomes – and learning collectively – where the members consciously strive for common and shared learning and/or working outcomes. Collective learning with collective processes and collective outcomes is the most ideal situation for an organization, but it requires more than just learning from others. Collective learning outcomes require that learners develop a shared understanding and meaning about the learning process and the new knowledge that is developed as a result of this. Moreover, the learners need to develop explicitly shared new insights or theories that are related to problems at work. Learning has to lead to changes in work, to be effective. Shared learning outcomes are realized when change takes place for two or more persons and when these learning results are explicitly present. A collective learning outcome can be a goal that the group has achieved or something else they have accomplished – for example a problem a problem solved. Collective outcomes are also for example documents, tools or products that are spread throughout the organization as a result of a collective learning process of the group.

Collective learning outcomes can nevertheless be more implicit: new insights that affect the group's working process and their competencies are as valuable as the codified knowledge that can be spread throughout the organization. Furthermore, collective learning outcomes can develop with significance only for the group or for the whole organization.

Relating this to the externalization phase described before, it becomes clear that externalization is strongly related to most ideal collective learning and collective learning outcomes emphasized. The importance of learning explicitly from each other, and developing or generating a collective outcome, is the most ideal situation for organizations (Hildreth *et al.*, 2000; Brown and Duguid, 1996).

Research model

Based on these theoretical notions, a research model can be constructed for a study of the learning function of a CoP. This model contains of three elements:

(1) group characteristics (communities of practice);

(2) externalization process (collective learning); and

(3) collective learning outcomes.

As explained in the theoretical framework, the variable group characteristics is in this research specified by the theory of CoPs. In this model the process of externalization, as described by Nonaka and Takeuchi, defines collective learning. The ideal collective learning outcomes are assimilated, as they are an important factor of collective learning and the relation to organizational learning (see Figure 1).
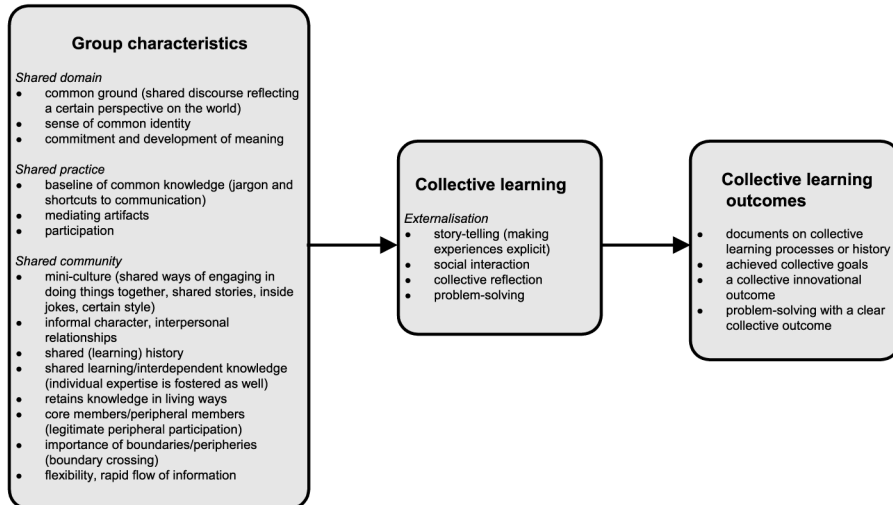
Group characteristics

Shared domain
- common ground (shared discourse reflecting a certain perspective on the world)
- sense of common identity
- commitment and development of meaning

Shared practice
- baseline of common knowledge (jargon and shortcuts to communication)
- mediating artifacts
- participation

Shared community
- mini-culture (shared ways of engaging in doing things together, shared stories, inside jokes, certain style)
- informal character, interpersonal relationships
- shared (learning) history
- shared learning/interdependent knowledge (individual expertise is fostered as well)
- retains knowledge in living ways
- core members/peripheral members (legitimate peripheral participation)
- importance of boundaries/peripheries (boundary crossing)
- flexibility, rapid flow of information

Collective learning

Externalisation
- story-telling (making experiences explicit)
- social interaction
- collective reflection
- problem-solving

Collective learning outcomes
- documents on collective learning processes or history
- achieved collective goals
- a collective innovational outcome
- problem-solving with a clear collective outcome

Figure 1.
Research model of group characteristics and collective learning

The validity of this model regarding the review and judgements of the learning function of CoPs in practice will be examined by analysing case study data on three groups in organizations.

The following research questions are leading:

(1) Do the three groups function as CoPs?

(2) To what extent do processes of externalization take place?

(3) To what extent does this lead to collective learning outcomes?

Research method

In order to answer these questions we relate data from three Dutch case studies about ongoing change processes within the organization and on-the-job learning with the research model on group characteristics and collective learning:

- a teaching department of a college for agricultural higher education;
- an expert group from the Dutch Government Service for land and water use; and
- a nature conservation team from the Dutch Forestry Service.

The three cases were all selected in the work field of nature conservation in order to keep the factor of developments in the work field constant.

The three cases

The teaching department

The teaching department is part of one of the six colleges of higher agricultural education in the Netherlands. Like other colleges, this institution is constantly developing and a lot is changing in the way education is or should be given. In this research, one department, namely "Planting", is studied closer. This department is relatively small; the core counts seven members. The group is also relatively new; it

exists for only two years at the time of the research and came out of a merger between two departments: "planting knowledge" and "planting education".

The expert group
The Dutch Government Service (DGS) for land and water use is the policy-executing authority for the arrangement of the rural area in the Netherlands. In every province are 50 to 100 specialists at work in projects. After reorganization, the specialists in the provincial departments became isolated with regard to their knowledge development. Yet, as a professional organization, DGS is dependent on the knowledge of their specialists. Therefore, DGS constructed eight strategic expert groups, where specialists share their knowledge and experiences. In this case study the expert group "rural development" is studied. In this group, twelve specialists form the core of the group and some peripheral members participate regularly.

The nature conservation team
The Dutch Forestry Commission (DFC) manages, commissioned by the ministry of agriculture, nature and food quality, approximately five percent of the nature ground in the Netherlands. The conservation work is assigned to conservation teams that are responsible for nature conservation in a specific area. Over the last years DFC went through two major changes. At first, DFC policy put an emphasis on the contact with the users of nature areas: civilians and societal organizations. A second important development at DFC is the decentralization of responsibilities to a lower level in the organization. In this case study, one conservation team is studied, which consists of seven men.

The three groups are not designed CoPs. The expert group could be seen as such, because it was intentionally formed to be a group for knowledge exchange and creation, where the other two groups are formed to perform a practice. These differential backgrounds have to be taken into account in the interpretations of this study's findings.

Instruments
We draw upon existing research material that is collected in a previous research project (Gielen and Hoeve, 2002). The existing data provided much information on the characteristics of the group and the social processes present, but less information on collective learning processes. In a follow up research, Mittendorff (2004) studied collective learning processes that are taken place in the three cases.

The data is collected between October 2001 and March 2002 and additional data in the Spring of 2003. In the first round, data were collected at three levels:

(1) On individual level through depth-interviews, concerning learning activities, problem solving, working and learning effects.

(2) On group level through group conversations, concerning learning processes, professional identity, norms and values. Also, data were collected through observation of group meetings.

(3) On organizational level through document research and conversations with HRM-managers of the participating organizations. The focus lied on the knowledge management in the organization.

In the second data collection round, individual semi-structured interviews were held with a core member of the group for each case, focusing on group characteristics, externalization processes and collective outcomes.

Analysis

The collected data were analyzed in two steps. First the existing data was analyzed with the framework described in the research model. The first author read the transcripts of the interviews and observations from the first data collection round, and assigned codes to fragments corresponding to the "sub-characteristics" from the research model. For example: "We talk in jargon all the time. A stranger would not understand much of it." was coded as "shared practice" or "It's difficult to discuss a subject that everyone finds interesting. Some people are strongly focused on the real traditional agriculture, although we decided that knowledge circle focuses on countryside renewal." as "no shared domain". The coder wrote memos during this process as a means of immediately recording all thoughts and difficulties relating to the coding process to be used in the next procedure of consensual validation.

The coded fragments were summarized and displayed in matrices to create an overview. The displays were discussed critically with the third author (the researcher that collected and analyzed the data of the first data collection round). Differences in the two analyzes were discussed and where differences were identified, the relevant parts of the transcripts and memos were read again and discussed extensively in order to reach consensus.

This first step resulted in a description of how the cases function according to the three elements in our conceptual research model. Based on these case reports it was decided for which variables additional data need to be collected.

In the second step the additional data was coded in accordance with the "sub-characteristics" from the research model. These coded fragments were used to update the displays. Again these displays were discussed critically with the third author. This discussion resulted in a more detailed description of how the cases function according to the three elements in our conceptual research model. These within-case reports were aimed at providing a clear view of the three cases separately. The cross-case analysis involved a comparative analysis, in order to deepen our understanding and explanation of the differences in results between the three cases.

Results

The teaching department

Group characteristics. The teaching department has a shared goal: to produce graduates who have adequate capacities in and love for their field of work. One member says: "Everybody tries to carry out their jobs as good as possible to do things right didactically". Furthermore, shared practice is the main factor that keeps the members together: they are strongly committed to the practice and feel great love for their profession. There are several "mediating artifacts" present, such as jargon. One teacher says: "If we talk about something, it is about professional books, et cetera. We also talk a lot about dictates, which has to be revised." The coordinator adds: "Actually, we talk in jargon all the time. A stranger would not understand much of it." In spite of this, there is no shared activity or enterprise. They share the practice of teaching, but they work mostly individually (with students) and have no regular

meetings where they act together in practice. Furthermore, their domain (common ground or identity) is divided in two groups: a more traditional "teaching identity" and a more modern, competence-based "teaching identity". A somewhat older teacher says: "I don't believe in big changes, it is too much risk. I want to stay with the well-defined, older, methods of teaching". This leads to difficulties sometimes; developments evolve rigid and slow, changes are not taken up easily because not all members of the group are flexible or rapid in their information flow. The coordinator of the group illustrates: "Creativity and flexibility is very important, but several colleagues are too rigidly focused on old routines, and that annoys me sometimes."

A shared community is present to a certain extent. It is a small group, with informal contacts and some interpersonal relationships. "We visit each other at home regularly, and we make music together sometimes." This however only applies on the core of the department. There is no regular contact with the part-timers. "They are involved in the process, and sometimes I do not even have part-timers, like in this period. I hire them per season. I try to keep in contact with them and they also come to meetings, but there is not much contact between them and the core members of the team." Formal contacts between members at school are not common. To a large extent this is due to the small amount of time. The group has little moments of being all together, to discuss or talk with each other. "We talk more to the students", one member argues, "Often it is only five minutes of talk with the other colleagues in the hall, and everything has to go quick. And there are only three departmental meetings in a year".

Externalization. In the teaching department, social interaction and story telling take place in some way, but depends on the time available. Reflection and problem solving happens mostly informally, not organized, only sometimes collectively, and very little is put down in writing. If the members have a problem they cannot cope with individually, they usually go to the coordinator. "Yes, they come to me often. Then we sit together very informally and think of how we will solve it." One teacher explains: "Motivation for learning comes for the greatest part out of my self, we do not learn collectively in the department, for one thing because there is no time."

Collective outcomes. The group produces little collective learning outcomes. The practice requires "normal" documents like dictates which are often produced. "Dictates often need to be revised. If this is necessary, we discuss what part has to be revised and decide who should make the revision." These outcomes are used by the whole group but are not always produced collectively. Moreover, the practice of teaching is very structured, and leaves not much space to invent or change a lot. "The study's manual is built completely around the final goals students have to reach and that is nationally defined. So it is not possible to invent something ourselves. It is the job of the teachers to function within these rules and established goals." Finally, very little is put down in writing, except for minutes of meetings or (revised) dictates.

The expert group
Group characteristics. The expert group had and still has difficulty finding a shared goal or vision. "In the past years, a lot of knowledge was shared through talking, to define the goal and identity of this group. But we are still searching". The members have different visions towards their work and their interest in the knowledge circle (some are more "traditionally minded" than others). "Some people are strongly focused

on the real traditional agriculture, although we decided that knowledge circle focuses on countryside renewal. That makes discussions difficult sometimes".

In the group a shared jargon is present, but there are no other mediating artifacts, such as documents regularly used by the group. The members of the group share a practice (the practice of agriculture and countryside renewal), but because they work apart from each other in their own provinces they do not perform a practice "together". Working cooperatively is also difficult because of their specialist background. They all have their own expertise and are sometimes reluctant to learn from specialists with a different background.

A shared community is not really present. The group is relatively new and has not developed a "mini-culture" (yet). "The group sees each other once a month, so they do not know each other really well, although it became better the last two years. They know from each other what they do, et cetera, but that is the main thing". The coordinator is the pivot of the group, he guards the themes and the processes in the group: "If I do not direct the processes in the group actively, nothing happens."

Externalization. There is little social interaction present in the group, although it increased in the two years the group is active. The members of the knowledge circle talk to each other during the meetings, mostly about work. Story telling processes are present during discussions: members need to make their experiences explicit to enable a reflection process with the other members in the group. One member explains: "The learning process is mostly listening and sharing". The knowledge coordinator says "The goal of the knowledge circle is to develop new knowledge and exchange knowledge between the specialists." But knowledge development happens in the (new) projects in which the people are working in their own provinces. "We support them with these projects and ask the members to share their experiences in the knowledge circle, so other people can benefit of this knowledge too." The most important process in the knowledge circle is sharing knowledge, exchanging knowledge and asking for feedback. "It works as a kind of sounding board. People get a lot of technical information and feel the need to talk to other specialists about how to handle it." Development of new knowledge is (up till now) very scarce. "The questions we are dealing with now are about the transition of the agriculture, and that is a very slow process." Because of the small amount of things they have achieved yet, they do not reflect on collective problems, actions or products of the group.

Collective outcomes. The most members produce individual outcomes that are shared in the group and participate in discussions, but do not often cooperate together to produce a real product, unless the coordinator addresses the importance of it. There are some outcomes of discussions (explicated in documents), but it is not evidently clear if these outcomes are generated collectively, because the knowledge coordinator produces these outcomes most of the time.

The nature conservation team

Group characteristics. The nature conservation team is a solid group with a common ground, all members feel great love for nature and the nature conservation. "We are committed to nature, and feel responsibility for each other, and for the work." A fieldworker adds: "Love for the job has to be there, for us fieldworkers, that is our mainspring. The work is at the same time our hobby."

There is a collectively shared commitment towards their practice and domain. Next to this, the group has a strong sense of a common identity; the members always speak in we-form, and "step outside as one man". The supervisor also explains that: "In this team you just cannot function as a member alone, the team as a whole is responsible. I also do not see how I can organize an individual reward system that the management of DFC wants to implement, because the team does everything together." The practice is a central issue and participation is crucial. The group performs much work together, or with two colleagues together. It is clear that there is a shared enterprise or undertaking.

Furthermore, the group can be characterized as open, informal, independent, unified, pleasant, with room for discussion, informative, flexible and efficient. They developed a mini-culture, where norms and values, jokes and informal chatting play an important part. All members of the group know what they talk about and know what everybody's expertise is. The members argue that this is for one part due to the large amount of informal contact. "Most important is the informal contact. Everybody knows what's going on and who is responsible for what." The supervisor also argues: "We all share the same interests, and we can go to Poland together for ten days, for instance. We have done that several times." Furthermore, there are never real big problems in the group: "Everybody directly tells what is wrong and there is a lot of contact, so problems are always solved directly."

However the group can also be rigid or conservative. When a new forester with new tasks was introduced, the group reacted "hostile", because this function did not match with the group's routines. "He had to get used to the new function, the group had to get used to it, and the habituation did not get through. But that also has to do with us, we are here for 25 years, so we know how it works here."

Externalization. In the group, a lot of social interaction, discussion and story telling (jokes, remarks, etc.) is present. Everybody gives their opinion and gives account of things that are done or should be done. One fieldworker says: "Our success is that we discuss everything with each other and everybody can contribute ideas. They are not always executed, but in general it works well. And there is also space for own plans and execution." Furthermore, the group invents a lot, especially when it comes to improving their work (practice). The supervisor explains: "The members invent a lot, because they are motivated and have love for their job."

What and by whom things have to be done is collectively discussed in the meetings. Collective reflection also happens during meetings, for example by means of problem solving. One member says: "Problem solving never happens alone. You always speak about problems with the group. Usually this is about practical things, if I do not know how to handle something I ask the group. The group solves it, or I go to someone with specific knowledge about the problem."

Collective outcomes. In the meetings of the team, discussions are often concluded with a collective outcome; an agreement, an answer to a problem, the brand of the new tractor, etcetera. Next to this, another particularly concrete collective outcome is a rack that the group has invented. This rack is made for pollarding willows, which can be mounted on a tractor's frontloader and makes pollarding more easily. The group made this rack because they had a shared goal (doing as less manual work as possible) and everyone in the group now uses it. The collective outcomes in this team however stay mostly "implicit"; they are not codified in documents (besides the minutes of meetings and the rack for example). The outcomes are often the solutions of problems, not

documented and communicated to other groups. Table I summarizes the findings of
this study.

Conclusions and discussion

This article aimed at understanding communities of practice (CoPs) as stimulating
forces for collective learning. Three working groups were analyzed with three research
questions in mind, namely how the three groups function as a CoP, to what extent
processes of externalization take place, and to what extent these processes lead to
collective learning. By reflecting on the results we now try to answer our research
questions and discuss these findings.

Do the three groups function as a CoP?
First of all, it is clear that the groups in this research differ from each other. The
teaching department has some characteristics of a CoP. There is a shared and

Cases	Group	Elements Externalization	Collective outcomes
Teaching department	Shared domain and shared practice, not a fully developed mini-culture, but some characteristics of a shared community (however impeded by less time)	Less time for social interaction and story telling. Reflection takes place, but not in a structured way (mostly at ad-hoc basis) and not always collectively. Problem solving happens individually and collectively	Some collective learning outcomes (for example dictates or minutes after an evaluative meeting), however not always produced collectively
Expert group	There is no shared domain (no clear vision or goal), and no shared practice. There are some informal contacts, but there is no mini-culture. Moreover, the group would not exist without the knowledge coordinator	Small amount of social interaction, though some story telling and discussion (making experiences from the projects in the provinces explicit). The group often discusses about themes or problems that are introduced by the knowledge coordinator. There is not much collective reflection	There are collective outcomes, sometimes these outcomes are collectively produced by the group, sometimes not (or not explicitly) and is the knowledge manager the important factor in producing or documenting a collective outcome
Nature conservation team	Shared domain, shared practice and shared community. Definitely a community of practice, with a strong (mini)-culture	A lot of social interaction, story telling, collective problem solving and some reflection	Several collective outcomes for the group, although not always explicitly recorded in documents or spread throughout the organization

Table I.
Summary of the results

structured practice of teaching in which the members participate and which defines their work. There is however no really shared enterprise. There is also an absence of a shared domain (there are "two identities" present). In the expert group, there is no shared community; the members come together with an explicit goal of sharing knowledge. There is also no shared domain and no shared practice. The nature conservation team can be identified as a typical CoP. It is a very coherent group, where culture and practice play an important part in the functioning of the group, and a lot of the work is done collectively. But this CoP can also behave very conservative and reluctant towards change.

To what extent do processes of externalization take place?
In the teaching department are not many collective learning processes present; some externalization happens through reflection and problem solving in meetings. In the expert group, the members externalize their experiences because they share no practice or domain (the specialist all work in a different area). The members of the expert group learn mostly individually. This group has more characteristics of a "learning team", than of a CoP. A "learning team" has the explicit goal of learning or problem solving, and the processes in these teams mainly encompass the exchange of knowledge. In the nature conservation team, because of the communal relationships, shared domain, practice and commitment, there are a lot of externalization processes present. For example collective problem solving, reflection and story telling.

To what extent does this lead to collective learning outcomes?
In the teaching department, learning outcomes are scarce. The expert group produces some collective outcomes, although these would not exist without the knowledge coordinator. The nature conservation team produces a lot of collective outcomes, though partly implicitly.

CoPs as stimulating forces for collective learning?
These findings show that groups of workers do not always function as a CoP, nor have the potential characteristics for collective learning. It is clear however, that the nature conservation team functions the most as a CoP and also entails the most collective learning processes as well as the most collective outcomes. And it is clear that the group that was intentionally formed to act as a CoP (the expert group) is not functioning as one, and has less collective learning present. So, starting from our framework the conclusion can be drawn that when a group has many characteristics of a CoP it is indeed likely to encompass more collective learning and more collective learning outcomes.

However, a critical remark has to be made. Although many researchers and managers glorify the concept of CoP as an instrument for learning, these groups are maybe not simply "the best way to improve organizational learning". Even if a group can be classified as a real CoP, this does not mean that the group's learning is always in favor of the organizational learning process. What was argued in the theoretical framework also became clear in the nature conservation team: a solid group can be rigid and not willing to change the routines in the group. It would be important to deepen the investigation about how such conservative nature of CoPs works, and how they can become more open for change and innovation.

Judged by the research findings described in this article, the framework used helps to identify the quality of the group and the organizational effecitivity in relation to organizational learning. It might indeed help managers to classify whether groups in an organization have these characteristics, whether these characteristics are in balance and what might be needed to develop towards the ideal CoP with a great learning potential. Questions like "do the members share a same problem or practice", "do they have a shared identity and history", "do they tell stories to each other", "are they likely to solve problems together", are important. But also questions such as "is the group open-minded towards change" are important. Answers to these questions can help facilitating and stimulating the group to develop towards a community that is of real value for organizational learning. Managers can facilitate these groups by stimulating for example informal meetings, focusing vision or recognizing the implicit learning in these groups and trying to "externalize" the implicit learning for a broader use. It is also possible to relate the informal learning to a program or learning process where the knowledge can be shared and discussed throughout the organization, for example by offering a computer-supported learning environment with built in support for collective learning (see De Laat, 2001; De Laat and Lally, 2005). This offers a possibility to exchange the outcomes to other CoPs or groups in the organization, resulting in a broader organizational learning process.

Follow-up research can make clear how the framework can be expanded with considerations regarding the way in which CoPs experience the need to change or learn. Questions such as "Is change or learning of economical relevance to the group?" and "Is there a clear view on potential use that gives them a reason to change?" might then be asked.

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Further reading

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