The resources and obstacles of creative collaboration in a long-term learning community

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A R T I C L E   I N F O

A B S T R A C T

In the framework of a subject-centred socio-cultural approach, this study investigates creative collaboration and the resources for and obstacles to it in a long-term learning community of ten teacher students. The study focuses on five different learning situations over a 2-year period. The data were taken from teacher students' evaluations and accounts (on given criteria) of their videotaped group-learning sessions, and their reports of the obstacles to creative collaboration. Using the students' evaluations of the five videotaped group learning situations, the sessions they assessed as the least and most creative were compared, the aim being to discover the most important situation-specific contextual resources for collaborative creativity in the learning settings addressed. The findings showed that creative collaboration was manifested by the presentation of alternative views, and in most situations also by the production of new ideas. However, it was less evident that group discussion would in every session reveal contradictions or lead to the disclosure of opposing views concerning different meanings; nor would it necessarily create an elaborated understanding of the learning topic. The main obstacles to creative collaboration were related to the emotional atmosphere and power relations of the group. A comparison of the contextual conditions of the least and most creative evaluated situation illustrates that the least creative situation was characterised by participants' disputational talk, aimed at invalidating opposing opinions. Here, the group atmosphere was emotionally charged in a negative sense, and mutual care taking was lacking. The unsafe atmosphere made group members afraid of being emotionally bruised by other members. The most creative situation was characterised by complementarity in participants' talk and by inclusive utilisation of each other's views. The shared history of the group was an extremely important resource for group dialogue, allowing alternative future scenarios to be constructed reflectively. The emotional scaffolding between students was rich, and the tutor's resources were utilised. Results are discussed in terms of complementarity, emotions and power relations.

1. Introduction

Successful collaboration in collective learning settings has often been described as involving the same processes as creative collaboration. In both activities, new options are presented and elaborated in a wide-ranging critical dialogue. Through dialogical interaction, new conceptions are collectively constructed.

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Recent research has shown that in successful collaboration within collective learning settings, participants build on each other's ideas in order to reach an understanding that was not available to any of the participants initially. However, in order for this to happen, the participants need to be committed to shared goals, and have sufficient trust in each other to join in the shared endeavour (e.g., John-Steiner, 2000; Mercer, 1996; Moran & John-Steiner, 2004; Sawyer & Berson, 2004). The participants must also enter into critical and constructive negotiation of each other's suggestions. Well-grounded arguments and counter-arguments need to be shared and critically evaluated through collective talk (Mercer, 1996; Mercer and Littleton, 2007). The conditions are similar to those needed for collaboration in creative endeavours (Moran & John-Steiner, 2004).

From such considerations, educational professionals are increasingly coming to realise that learning and creativity go hand in hand (Moran, in press). This is especially true among researchers working within the approaches that have been labelled socio-constructivist, cultural-historical or socio-cultural. In these approaches learning is regarded as collaborative meaning-making and knowledge construction rather than as knowledge acquisition. Such conceptions have tended to break down the old dichotomy between learning and creating. The differences between the two constructs become even more minor when we address them as collective processes (Craft, 2003; Jeffrey & Craft, 2004; Moran, in press).

Creativity researchers commonly use the metaphor of 'little c' when speaking of creativity at the individual level, that is, when they look at the ways in which a personally new understanding, idea, practical solution or production emerges for an individual (Craft, 2003; Moran, in press). At the opposite end of the scale, 'big C' means something that emerges as historically new within the broader culture (Boden, 1990). In addition to these categories, Moran (in press) posits a 'middle c', meaning a new product or idea that emerges within a single organisation or a small community. The study described in the present article investigates creative collaboration in a learning community of ten students; hence it addresses collaborative creativity in the context of this 'middle c'.

The study focuses on a small-group-based learning community of teacher students who studied and worked together over a period of 3 years. We were not primarily interested in the material creative products that students might accomplish, but rather in the professional learning and identity work that might promote collective professional growth within the learning community (cf. Craft, Cremlin, Burnard, & Chappell, 2007). In such a community, where group members need to plan and evaluate their collective learning processes and also to complete their concrete studying programme, productive learning is a truly challenging endeavour. 'Middle c' creativity is needed to create strategies for collaborative working and learning, to negotiate solutions reconciling the differing views of individuals, and to produce collective learning outcomes, including an elaborated understanding of the learning topics addressed. In order to arrive at such an elaborated understanding in a community in which there are a multitude of differing conceptions, group members need to express alternative views and discuss them in such a way that the different kinds of meanings and contradictions are addressed and revealed in the group dialogue.

Our definition of collaborative creativity in the 'middle c' context takes as its starting point the general conception of creativity as including something new (e.g., Sawyer, 2003, 2004; Sternberg, 2003). Although creativity has been difficult to define, and empirical researchers have employed different operationalisations of the term, conceptions of creativity usually agree that creativity means novelty (John-Steiner, 2000; Sawyer, 2003). In a learning group discussion, *novelty* means that new and alternative ideas are suggested in respect of the problems at hand, and that processes of collaborative creativity are needed to solve the problems that emerge from the collective learning tasks. Nevertheless, the novelty of the idea alone is not sufficient for collaborative creativity; in addition the novel idea must be in some way reasonable and sensible in the situation concerned. This means that to be creative an idea must be socially appropriate and thus be recognised as socially valuable in some way (Sawyer, 2004; Sternberg, 2003).

In a peer-group learning community neither the emerging problems nor their solutions are known in advance, but the group needs to work together in order to define the problems and find solutions to them. Thus, creativity in collaboration can be understood to emerge within dynamic processes of co-construction; these will produce novel – and appropriate – ideas regarding the problems faced in collective learning endeavours. The creative process in a collaborative learning situation further entails opposing ideas being thoroughly discussed, in such a way that differing opinions and conceptions are related to each other. In such a process of collective learning an elaborated understanding of the learning topic can emerge.

On the basis of the socio-cultural view of creative collaboration, we would expect that the processes of collaborative creativity will be situation-specific, in the sense that the conditions and resources of the collaborative learning situation must also be addressed if the processes are to be understood (e.g., John-Steiner, 2000). In a long-term learning community the shared history of the community can be expected to function as an important resource for collaboration (Mercer and Littleton, 2007).

With the exception of studies addressing creativity in workplace conditions (Gruber, 1989; McAllister, 1995), so far there has been a lack of studies addressing creative collaboration in long-term learning communities. However, although long-term 'middle c' creativity has not been much analysed, a few studies have looked at collaborative pairs working together over a period of years. Within the socio-cultural framework, John-Steiner (2000) has used document data to analyse the long-term collaboration of famous creative couples in the fields of science and art. The emphasis is placed on the potential of stretching one's identity through partnership, through sustained and varied actions, and through the interweaving of social and individual processes. In the terms used by Vygotsky, the partners create zones of proximal development for each other.

John-Steiner (2004, pp. 196–199) identifies different patterns of collaboration: distributive, complementary, family, and integrative. Among scientific couples complementarity is the most common. It emerges from the fact that the collaborators are not similar people; rather they are different in terms of their worldviews, perspectives, expertise and prior knowledge.

Complementarity in collaboration means that each individual, who realises only a subset of the human potential, can in partnership broaden, refine, change and rediscover his or her individual possibilities. The complementarity can be a matter of temperament, motives and emotions, or it can be based on knowledge and skills. A joint and passionate interest in solving or accomplishing the task at hand seems crucial to collaborative success. Within a partnership, participants can expand their commitment and endurance (John-Steiner, 2004, 189).

Challenged by the lack of studies concerning long-term collaboration in 'middle c' learning conditions, this study aims to gain a greater understanding of collaborative creativity in a long-term learning community of university students, including the obstacles and resources pertaining to such creativity.

1.1. Conditions and resources for creative collaboration

Several researchers have noted that the environment – both physical and social – is important for creativity (Hunter, Bedell, & Mumford, 2007). It has been suggested that the characteristics of the social environment affect whether and how creativity arises (Csikszentmihalyi, 1996; Florida, 2002; Gardner, 1993). Different aspects of contexts have been mentioned as having the potential to influence creativity. These include environmental attributes, organisational conditions, the social atmosphere, trust, support and individuals' intellectual resources (Moran, in press). Within the socio-cultural framework, environmental and social contexts are seen as important resources for creative collaboration (Moran & John-Steiner, 2004; Sawyer, 2003). Moreover, individuals are seen as part of the social environment and hence as resources for each other. A single student's actions, and the ways in which students interact with each other, form part of the context for other students (Moran, in press). Such mutual influence becomes apparent in students' dialogue, when the group needs to make plans and solve problems in-group discussions. The socio-cultural approach and especially the cultural-historical notion of Vygotsky further emphasise temporal interactions in creativity. This means that creativity is a cross-time phenomenon. It involves moving beyond what exists now, using resources brought from the past, to devise better options for the future (Mercer, 2000; Moran, in press).

In a long-term learning community, the shared history functions as an important resource for collaboration (Mercer, 2000). Out of the history of the group comes the gradual establishment of a certain kind of culture, a customary way of doing things and collaborating. The culture of the community thus incorporates knowledge, skills and learning methods, environmental tools and social aspects. However, the culture does not contain these as separate elements, but rather arrives at an infused holistic manifestation of the community. Although the culture changes in the course of the developing history of the community, it carries within it past events and involves a certain kind of continuity (Moran, in press). This means that when a certain kind of community culture is established it is not easy to change, even in cases where it might be counter-productive for collective learning and creative collaboration.

There is some division among researchers concerning the requirements that must be in place for creative collaboration to occur. Generally speaking, trust and security have been seen as especially important. Bull, Montgomery, and Baloche (1995) emphasise the importance of taking care of college students' psychological safety if creativity is to emerge. Vass (2007), who analysed children's classroom-based collaborative creative writing via longitudinal observations of pupils aged 7–9, gives a central place to emotions in phases of shared engagement. Nevertheless, although safety has been much emphasised as a necessary condition for creative collaboration, some researchers have suggested that it might be counterproductive for creativity. It has been argued that challenge, frustration, confusion and perseverance are key elements, even at the risk of a loss of security (Csikszentmihalyi, 1996; Gardner, 1993, Gruber, 1974).

Trust seems especially important in long-term relationships, whether they exist among creative couples (John-Steiner, 2000) or in classroom contexts where students work together for many years (Craft, 2003). Trust consists of respect for another person's different perspectives, an expectation of good will, and confidence in the other's ability to contribute to the common purpose. Such trust is the foundation for the kind of collaboration that allows the development of true sharing, openly negotiated conflict, and a long-term relationship, even when uncertainties and risks are present (Moran & John-Steiner, 2004).

In a group-learning context trust includes individuals' emotional safety in collaborative situations. If they feel safe they do not need to be afraid of threats to their personal integrity such as can arise through insults or other personally bruising actions. In long-term collaboration, trust further includes people's confidence that they will receive help from each other. Such mutuality means the provision of both emotional and intellectual scaffolding in difficult situations (John-Steiner, 2000, pp. 127–129). In situations of this kind, especially when they concern critical evaluation – and even more crucially, when they concern the actual dynamics of the group, and questions of exclusion vs. inclusion of some group member – it is very important that participants respect each other's mutual vulnerability. This is particularly important in questions involving unequal power relationships. Issues of power are often very sensitive, especially from the perspective of those members who feel themselves to be powerless and who have minor participation in the group. By contrast, those who are in power often have difficulties in appreciating the point of view of those who lack power (Eteläpelto, Littleton, Lahti, & Wirtanen, 2005).

Collaborative partners can create for each other zones of proximal development in the emotional sphere (John-Steiner, 2000, pp. 127–128). Developing partners can thus expand their affective resources by appropriating the consequences of the shared experience. Such a process includes identification, scaffolding, an expansion of complementarity, and constructive criticism. Emotional scaffolding creates a safety zone within which both support and constructive criticism between partners can be effectively practised (John-Steiner, 2000, p. 128). Collaborative partners can thus build on their solidarity. John-Steiner

(2000) concludes that 'mutual care taking' is a fundamental aspect of learning in the emotional zone of creative collaboration. Storey and Joubert (2004) use the metaphor of an 'emotional dance' in describing creative collaboration; they suggest that a mutual relationship of trust is a key factor in creative collaboration. Similarly, in a discussion of creative processes in team working, Searle (2004) suggests that a key factor affecting participation in any creative task is the level of trust between team members. In order to enhance creativity, a safe environment is required in which vulnerability is minimised.

Approaching the subject from a cultural-historical point of view, one could assume that the optimal conditions for creative collaboration in a learning community involve the emergence of a collective zone of proximal development. In this collective zone, group members function as resources for each other. From studies of long-term collaboration we could expect that the most important emotional resources in creative collaboration will include perceived trust and safety, manifested as emotional scaffolding and mutual care taking. When such resources are provided by the community, they serve as productive conditions that allow participants to present alternative views, revealing contradictions between different meanings and thus creating a multidimensional understanding of the learning topic.

In a situation where opposing views or critical opinions are presented, tensions will probably emerge. Nevertheless, tensions are necessary, since the goal of creative collaboration is not simply to reach a consensus, but to arrive at an outcome that gives sufficient weight to critical discussion and the evaluation of alternative views (Mercer and Littleton, 2007; Moran & John-Steiner, 2004; Wegerif, Linares, Rojas-Drummond, Mercer, & Velez, 2005). Without the necessary condition of critical argumentation, complementarity (in the sense of utilising participants' different kinds of expertise, opinions, values and world views) cannot be realised.

1.2. Aims and research questions

In this study we address creativity in the 'middle c' context within a long-term learning community of teacher students. In operationalising creative collaboration we take into consideration the following aspects of collaboration:

(i) the emergence of novel and appropriate solutions to group learning tasks. Depending on the task at hand, such a novel solution might be a new idea, a shared understanding, a novel way of approaching a problem, or a strategy for shared working. Although novel and appropriate, such suggestions and ideas may often contradict prior conceptions (see e.g., Sternberg, 2004) and thus represent alternative conceptions to those previously suggested. We have therefore operationalised the emergence of novel ideas also in terms of;

(ii) alternative views expressed in the discussion. For the collective co-construction needed for the emergence of collaborative creativity, new and alternative suggestions need to be discussed in such a way that different contradictions and opposing views – as well as the meanings given to different conceptions – will be revealed. For this reason, in operationalising collaborative creativity processes we have further considered;

(iii) whether the discussion revealed contradictions and opposing views concerning different meanings connected with the topics in question. Since all the learning topics in the learning community of teacher students addressed complex and multifaceted phenomena (e.g., good teachership, problems of social interaction and productive feedback), creativity in the collaborative learning outcomes can also be manifested as elaborated and multifaceted conceptions of these issues. In our operationalising procedures we therefore considered also;

(iv) whether the discussion constructed an elaborated and multifaceted understanding of the learning topic.

According to Moran and John-Steiner (2004), there has not been sufficient research on collaboration over longer time frames or on the emotional elements belonging to collaboration—aspects in which the emergence of trust and synergy might well be crucial. Furthermore, studies are often limited by the collaborators' lack of conscious awareness regarding the dynamics of their collaboration. In addition, retrospective bias is common; since collaborators have not kept notes while the creative ideas were being developed (Moran & John-Steiner, 2004, pp. 12).

Creative collaboration in learning contexts has so far been studied mostly in the context of short-term self-contained episodes. In such situations the role of the group history cannot be taken into account, and its role as an important resource for collaboration is likely to be neglected. We would, however, expect that the essential conditions for productive collaboration might be slow to emerge. Time and a shared history of collaboration are needed in order to develop mutual trust and confidence, as well as to develop a shared understanding of each participant's resources. In accordance with the socio-cultural approach we assume that the teacher students' long-term learning context provides tools and means for symbolic mediation; also that the shared history of the community functions as an important resource for creative collaboration.

At the methodological level, we applied a subject-centred socio-cultural approach, which emphasises the agency and subjectivity of individual participants (Eteläpelto, 2008; Eteläpelto & Saarinen, 2007). This implies that we do not merely focus on the structures and processes of collaboration, manifested as objective indicators at group level (including for example the nature of the speech, and the quality of the discourse). Instead, our goal is to recognise participants as social actors whose experiences and evaluations have to be heard and taken seriously. We thus try to treat our participants, the teacher students, as 'subjects with concerns' rather 'objects of concern' (Eteläpelto et al., 2005). In this study we therefore used the teacher students' own evaluations (conducted according to given criteria) based on our previous operationalising of the students' own videotaped group-learning sessions. The five situations that we asked students to evaluate according to the given criteria were selected by the researchers over 2 years of studying. Using these students' evaluations of the five situations, the study

aimed to understand the nature and quality of the creative processes in the students' collaborative learning situations. In addition, the study aimed to discover what the teacher students perceived as the most important obstacles to their creative collaboration in the five collaborative learning situations. In addition to using the students' own accounts of the aspects in question, the conditions and resources for creative collaboration were elaborated by focusing on two of the five situations that the students had evaluated as representing the *least* and the *most* creative situations in terms of the criteria adopted. These criteria were used in our operationalisation of collaborative creativity in the long-term learning context (see above). In order to understand the contextual elements and resources necessary for collaborative creativity, we focused on the situation-specific conditions and contextual aspects which have been mentioned in previous studies as possibly having importance for collaborative creativity in collaborative learning communities. Such contextual aspects include the emotional atmosphere, the general nature of the talk (complementary vs. disputational) and the use of different kinds of resources in the dialogue. These were addressed by the researcher using the transcribed discussions from the two videotaped situations.

The research questions of this study can be specified as follows:

(1) What kind of situation-specific creative processes—operationalised as:
  (i) the emergence of novel solutions;
  (ii) the expression of alternative views;
  (iii) the revealing of contradictions and opposing views concerning different meanings connected with the topics;
  (iv) the co-construction of an elaborated and multifaceted understanding of the learning topic—can be identified from teacher students' accounts of dialogical situations within their own long-term learning community?
(2) What did teacher students perceive as the most important obstacles to creative processes in the learning situations within their own long-term learning community?
(3) Within a long-term learning community, what kind of social, emotional and intellectual resources and conditions were present in those learning situations in which creative collaboration emerged?

2. Methods

2.1. The subjects and the learning community

We focused on a trainee teacher group of ten students, consisting of eight females and two males, aged 20–40. At the time of the final stage of data collection (i.e., administration of the questionnaire, see below) the students were completing their third year of university studies. They were enrolled on an experimental programme of teacher education, within a university department of teacher education in Finland. The group formed an intensive group-based learning community, within a programme that originally encompassed some fairly ambitious ideas, being based on social constructivist and socio-cultural notions of learning communities. The purpose of the intensive small-group method was to promote the teacher students' competencies for constructing productive learning communities.

The small-group studies were scheduled to last 3 years, starting in the first year of the Master's Degree programme for teacher education (primary school level). The studies would last 5 years altogether. Studying and learning in the group was based on a process curriculum which provided merely the framework for the acquisition of necessary teacher competencies. Within the curriculum, the assessment of individual and group-based learning processes/outcomes was seen as a continuous process. It was envisaged that within this process students should work towards the specification of the goals of their learning. Because the curriculum existed as a somewhat sketchy framework, it provided a good deal of autonomy and space for students' own initiatives and creativity. The students needed to negotiate and collectively define their ways of learning, and to specify the general study themes envisaged for each year as concrete objects of study. They also had to search for and select the textbooks and articles for their studies (nevertheless utilising recommended literature).

Throughout the 3 years, the students had to reconcile individual and group-level goals while making plans for their studies. The curriculum thus required a great deal of creativity at the community level – the 'middle c' – in order to construct group-based plans and find the most productive methods of studying. The dominant idea of the curriculum was to combine theory and praxis in such a way that students could reflectively use their own learning community – and the experiences gained within it – as a laboratory for the analysis and promotion of their individual and shared understanding of collaborative learning. As a consequence of such continuous group-based evaluation and of the goal-setting based on the evaluation, the studies in the group involved problem *finding* just as much as problem *solving*.

In the first year of the studies, the content-specific themes included learning about social interaction along with an analysis of good teachership; thus students considered, for example, how to give productive feedback, especially in group-based learning contexts. In the second year of their studies, the students addressed themes such as problems connected with social interaction and the ground rules of the learning community. The second year of the studies was when students started their studies of school subjects and carried out part of their actual teaching practice in schools; however, they also gave further attention to questions of group dynamics. In the fifth session analysed in this study (see below), the students discussed the composition of their learning community for the coming year. They were especially troubled by a situation involving one student's extended absence from group activities. Note that in all the group-learning situations analysed in this study, the students discussed their own experiences and the processes of their own learning community. All the situations were highly emotionally charged, and for the most part they involved highly sensitive issues of group relations. The cohesion

of the group was very high and the students were strongly committed to their shared endeavour. Only one student out of the ten eventually left the group, although not because of any lack of commitment. The group also manifested high social responsibility and mutual care taking. This was manifested, for example, in the question of one member leaving the group, experienced as one of the most difficult issues encountered by the group over the 3 years.

2.2. Data collection

Throughout their studies, the students were encouraged to videotape their group working sessions for the purposes of later evaluation and reflection, and also for the purposes of research. The data collection undertaken for this study was resourced by clips from videotaped seminar sessions. The clips chosen were representative of typical group sessions, that is, sessions in which most of the students participated, and which addressed the most important learning topics discussed during each year. The themes of the sessions involved the following issues:

  Session I The analysis of good teachership;
 Session II How to give productive feedback in a group-based learning community;
Session III Problems of social interaction in a learning community;
Session IV The ground rules of the learning community;
 Session V Group composition, and the departure of one member from the group.

The points in the study programme from which the original video clips were taken were as follows:

- *from the first year of studies*: Session I, September 22 (the Autumn semester had started August 25); Session II, May 3 (the Spring semester had started January 7).
- *from the second year of studies*: Session III, October 1 (the Autumn semester had started September 10); Session IV, January 10; Session V, May 9 (the Spring semester had started January 7).

The students watched the video clips together while sitting round a large table. Prior to watching each video clip, blank questionnaires were given to each student. We asked the students to evaluate each of the five situations in turn. Using an open form of questioning the students were encouraged to give their individual evaluations, based on their feelings and understandings concerning the situations, as well as on their actual memories of the group history. Four open-ended questions (Appendix A) aimed to address the quality of the group dialogue in terms of collaborative creativity, and how such creativity was operationalised in this study.

The final data collection took place about 2 weeks before the group members completed their joint programme of studies. The researchers had pre-selected the five video clips, each lasting about 15–20 min. These were selected from 36 h of videotaped recordings of group-work sessions. The video clips were chosen to represent five time points, drawn from some of the most demanding projects the students had undertaken. In all the sessions except the first one, the tutor of the group had also participated in the session.

In addition, the students' accounts of the conditions and constraints connected with creativity were elicited with the following questions:

(e) Did the group acknowledge and accept as the starting point of their working that individual participants had different viewpoints?
(f) In each situation, what did you perceive as representing the greatest obstacles to the putting forward and discussion of alternative views?

2.3. Data analysis

The students' evaluations, and the accounts derived from their answers, were used as the data for this study. In the analysis of the questionnaire data (questions a, b, c, d and e), students' handwritten responses were first compiled as a Word document. The data were read and re-read by both researchers, and it was found that most of the open-ended responses were fairly short positive ('yes') or negative ('no') answers. However, a proportion of the answers included some provisos or specifications. In any case, they were all categorised into affirmative and negative responses. Those answers that included more than one word (e.g., 'yes, definitely', 'yes, although I think that. . .', 'for the most part') or that included explanations ('yes, because I saw this aspect as an alternative') were categorised as positive. Researcher triangulation was used in the categorisation. In a few (1–2) questionnaires there were blank responses; these were of course omitted from the final calculation of frequencies of students who gave affirmative responses. In order to compare systematically the evaluations across situations, the data were thus reduced into a quantitative form from which absolute and percentage frequencies could be calculated.

In the analysis of students' answers to the open question (e) (concerning the greatest obstacles to creativity across different sessions), the data were analysed using a thematic analytical method suggested by Braun and Clarke (2006). The thematic analysis started with the researchers becoming familiar with the data: the data were read and re-read in an active way—searching for meanings and patterns. In this connection, handwritten responses were compiled as Word documents

which were read by both researchers, first separately and later together during discussion of the meanings discovered. In the next stage, the initial data-driven codes were developed in the course of attempts to organise the data into meaningful groups. At this point the researchers retained the students' original verbal accounts, and again used researcher triangulation for a thorough discussion of the codes given. The third phase of the thematic analysis consisted of collating the codes into potential themes and gathering all the data relevant to each potential theme. This implied searching for and identifying a broader level of themes, and collating all the relevant detailed coded data within the themes identified. At this phase different codes were thus combined to form an overarching theme. Visual representations were used at this stage to help in sorting the different codes into themes. At this phase also the relationships between the different levels of the themes (the main overarching themes and the sub-themes within them) started to emerge. In the fourth phase of the thematic analysis, the themes were reviewed in order to check if the themes worked in relation to the coded contents and the entire data set, in terms of generating a thematic 'map' of the analysis. In the fifth phase, the specifics of each theme and the overall 'story' of the analysis were refined. This included also the selection of clear definitions and names for each theme (Braun & Clarke, 2006). In the final stage, the thematic map constructed was supplemented with quantitative data describing the frequencies of items belonging within each theme. Researcher triangulation was used at all stages of the analysis.

In our attempt to get an answer to the third research question – concerning the social, emotional and intellectual resources and conditions of learning situations in which creative collaboration emerges – the two most extreme sessions (best and worst in terms of students' evaluations on the four criteria provided) were compared. Although the selection of the best and worst session was based on students' evaluations, the researchers conducted the comparison of these two sessions with the purpose of understanding the contextual conditions and resources for collaborative creativity.

3. Findings

The following sections are presented in accordance with the research questions. In Section 3.1 we shall describe the findings concerning the various aspects of creativity elicited by questions (a)–(d). In Section 3.2 we shall describe students' accounts of the conditions and obstacles to creativity. Within this section we shall describe students' accounts of obstacles to creativity across the five sessions. Thereafter, having selected the two sessions that students had evaluated as best and worst in terms of the criteria given for the evaluation of collaborative creativity, the resources and contextual conditions of these two sessions will be elaborated in more detail (Section 3.3), utilising transcriptions of the discussions that took place during the sessions evaluated.

3.1. Types of creative process manifested in group situations

The students' reports of different kinds of creative learning experiences are derived from their answers to the questionnaire. The aspects of creativity assessed were:

(a) the emergence/creation of new ideas,
(b) the expression of alternative views,
(c) the disclosure of contradictions and opposing views, and
(d) the construction of an elaborated understanding of the topic.

Table 1 shows how students evaluated the five videotaped learning sessions in terms of the four given (a–d) criteria for creative collaboration. The table shows how many of the nine students agreed that the given criteria/aspect was fulfilled in each session. In the following paragraphs we shall address each criteria/aspect in more detail.

As regards Question (a), our analysis of students' reports on *whether new ideas were created/emerged in the collaborative group dialogue* showed that regarding most of the sessions, the majority of the students were of the opinion that new ideas had been constructed. However, there was considerable variation in the evaluation of different sessions in terms of the creation of new ideas. The most creative session in these terms was Session IV, in which the rules of the group were discussed. Here, concrete new strategies were constructed when the group discussed the methods and tools that might create ground rules for their own group working. The opposite case was that of Session III, which addressed the problems of social interaction in general, and especially the students' own learning community. This session was evaluated as the least creative in terms of creating new ideas. Less than half of the group gave it as their opinion that no new ideas had been presented in this session.

Table 1
Students' evaluations of creative collaboration on the given criteria (a–d) in the five group learning sessions: absolute and percentage frequencies of subjects responding affirmatively (*N* = 9).

Aspects of collaborative creativity	Session I	Session II	Session III	Session IV	Session V
(a) New ideas arising	7, 77.8%	6, 66.7%	4, 44.4%	8, 88.9%	7, 77.8%
(b) Alternative views expressed	9, 100%	9, 100%	8, 88.9%	8, 88.9%	9, 100%
(c) Contradictions revealed	6, 77.8%	6, 77.8%	3, 33.3%	4, 44.4%	8, 88.9%
(d) An elaborated understanding of the topic	6, 77.8%	7, 77.8%	3, 33.3%	6, 66.7%	9, 100%

As regards Question (b), the responses concerning *whether alternative views were expressed in the group discussion* showed that almost every student was of the opinion that alternative views had been expressed in all the sessions. We can thus conclude that in this respect the group both encompassed and expressed multiple views and opinions, which is one basic prerequisite for collaborative creativity. Because the culture of the group was in fact fairly conflicting and because a good many opposing ideas were presented (see Lahti, Eteläpelto, & Siitari, 2004), alternative views were very easy to recognise in the group discussion. Yet although alternative views were broadly present in all the sessions, there were qualitative differences in the strength of the disagreements they included. In some sessions opposing views functioned more as an enrichment of previous views, whereas in others they emerged as a strong dispute between two group members, or between two subgroups of the community.

As regards Question (c), responses to the question of *whether the group discussion revealed contradictions and opposing views concerning different meanings of the topic* showed that in this respect there was considerable variation between sessions. The weakest in revealing contradictions and opposing views was Session III. This session (concerning problems of social interaction) was also the one in which the fewest new ideas were raised. At the opposite end of the spectrum, Session V was assessed by the great majority of students as the best in terms of revealing contradictions. In Session V the topic of discussion was the composition of the group, along with the question of one member leaving the group. As regards all the other sessions, these fell between Sessions III and V.

Our results show that even though alternative views were commonly expressed in the group dialogue, it was not always self-evident that the discussion would reveal contradictions between different meanings. In fact, the revealing of contradictions in meaning was evaluated as the least frequent aspect of collaborative creativity to occur in the sessions (though there was considerable variation between the sessions). In general terms, we would conclude from this that revealing contradictions in meaning is a fairly demanding aspect of creativity in-group dialogues. At the same time, we would maintain that it is a prerequisite for an elaborated and multifaceted understanding of the kind of complex topics discussed by the teacher students.

As regards Question (d), concerning *whether the discussion constructed an elaborated and multifaceted understanding of the topic*, the majority of the students reported that in all the sessions, again except Session III, the discussion did indeed create an elaborated and multifaceted multidimensional understanding of the topic addressed. In Session III, only one third (33.3%) of the students reported that the discussion created an elaborated and multifaceted understanding of the learning topic.

Nevertheless, the provisos and specifications given in the students' answers showed that there were differences in how clearly the elaborateness of the discussion appeared to respondents. In the first session, in which an analysis of good teachership was taking place at the beginning of the studies, the discussion was assessed as creating multidimensional understanding; however, it was assessed as more limited and narrow in scope than the last session (2 years later), in which the composition of the group was discussed. In this last Session (V), the discussion was experienced as extremely wide in its scope.

To sum up, the analysis of the students' accounts showed that in group discussions, the aspect in which the students' learning situations were evaluated as best fulfilling the criteria for creative collaboration was that of *presenting alternative and opposing views*. In most sessions they also *collectively constructed new ideas*, especially ideas concerning new strategies for their collective studying. Furthermore, in most sessions students constructed a *multidimensional understanding of the learning topic*. However, it was not self-evident that the discussion would lead to the *revealing of contradictions and opposing views concerning meanings*.

To sum up, comparison across the sessions demonstrates that there was considerable variation across the sessions in terms of students' evaluations. Session III seemed to represent the worst in terms of students' evaluation in most of the aspects of collaborative whereas Session V was in most aspects the best (see Table 1).

3.2. Students' accounts of the conditions and obstacles to creativity

The students' evaluations of the conditions and constraints surrounding creativity were probed by Question (e) which asked whether the group acknowledged and approved as the starting point for their working the existence of different viewpoints among individual participants. Tolerance of different opinions has usually been considered a very important condition for creativity. Such tolerance has been emphasised both at the wider social level – manifested as a tolerance of diversity (Florida, 2002) – and at the community level, as the precondition for utilising participants' different expertise and temperaments, and thus for applying complementarity (John-Steiner, 2000).

Table 2 shows that there were considerable differences across the situations in how the different viewpoints were seen to be acknowledged.

Acknowledging different viewpoints was much more common in later sessions (and thus later in the studies) as compared with the first session. Whereas in respect of Session I only one third of the students agreed that different viewpoints had been acknowledged in the group discussion, in respect of the last session all the students agreed that different viewpoints had been acknowledged. Regarding the third session, which in many ways represented the worst situation in terms of creativity, about half of the students agreed that different views had been accepted. However, many provisos were mentioned, along the lines of '*Maybe different viewpoints were identified, but they were not accepted.*'

In answering Question (f) concerning the *greatest obstacles to suggesting and discussing alternative views*, every student reported at least some obstacles in every situation. Moreover, there was a great deal of variety in the obstacles reported.

Table 2
Students' assessment of the acknowledgement of differing viewpoints ($N = 9$).

	Differing viewpoints acknowledged
Session I	3, 33.3%
Session II	5, 55.6%
Session III	5, 55.6%
Session IV	7, 77.8%
Session V	9, 100%

Thematic analysis (see Section 2) was conducted across the situations so that all the obstacles reported were analysed as one body of data. From the first stages of the thematic analysis, two main categories of obstacle were identified, namely (A) group level obstacles, and (B) individual level obstacles (see Fig. 1). In the second stage of the analysis we thematised subjects' reports as sub-themes, on the basis of the similarity between the obstacles. At the group level, the following sub-themes were arrived at:

 (i) the discussion culture;
 (ii) the history of the group;
(iii) the focus or lack of scientific knowledge;
(iv) power aspects;
 (v) lack of [practical] knowledge.

At the individual level the sub-themes were as follows:

 (i) specific person and his or her behaviour, characteristics or opinions;
 (ii) negative affects displayed by some individuals;
(iii) members' individual voices;
(iv) people's own competencies.

In addition, there were other obstacles which were not categorised in the previous main themes. These included (C) the role of the tutor; and (D) the topic or subject being experienced as difficult.

In the second stage of the analysis we reviewed these themes and reorganised some sub-themes in order to check how the themes worked in relation to the separate extracts taken from the original accounts. This helped us to recognise new sub-themes, to combine and discard some previous sub-themes, and to further categorise the original data. At this stage we also constructed visualisations of the themes and sub-themes by drawing a thematic map (Fig. 1). Finally we counted the frequencies of reported obstacles belonging to each theme. Researcher triangulation was utilised at all stages of the analysis.

Fig. 1 shows that group-level obstacles were reported three times as often as individual-level obstacles. The group-level obstacles most commonly reported included the emotional atmosphere and power relations. The emotional atmosphere was mostly described in terms of a lack of safety or a negative atmosphere. Students reported as obstacles *'a very negative*
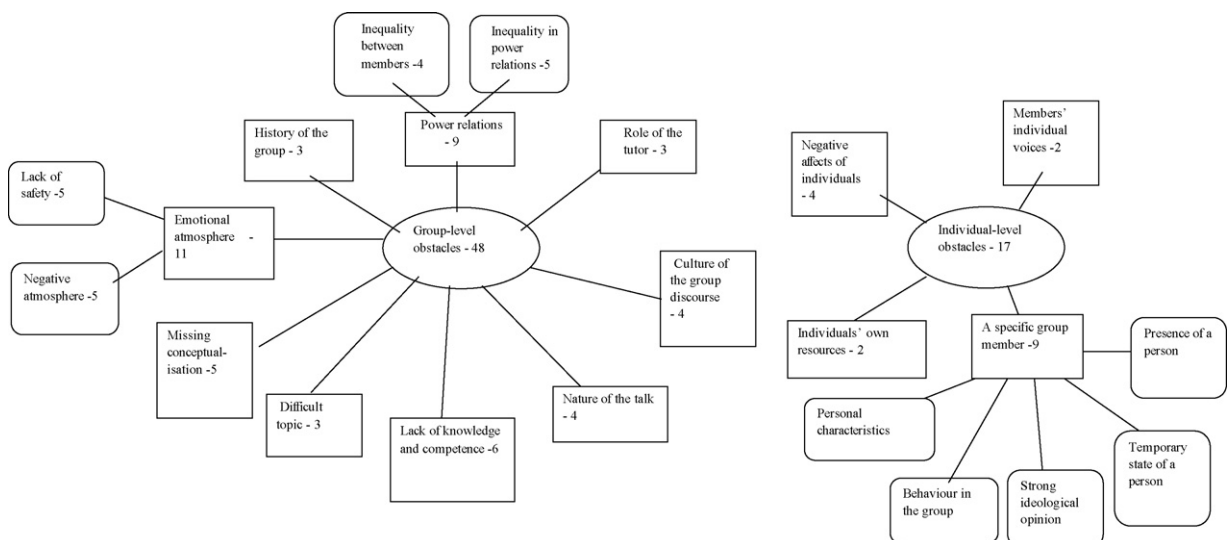
Fig. 1. Reported obstacles to group creativity: thematic maps of individual- and group-level obstacles including frequencies of the obstacles reported.

and oppressive atmosphere' (Session III), '*a rigid atmosphere and a lack of safety* (Session III)', '*the insecurity of the atmosphere*' (Session III), '*a heavy atmosphere*' (Session III) or '*atmosphere: unsafe and intolerant*' (Session II).

As mentioned above, trust and safety have been much discussed as necessary conditions for collaborative creativity in long-term situations (e.g., John-Steiner, 2000; Storey-Joubert, 2004). However, other qualities of the atmosphere, such as the importance of a convivial and affectively positive atmosphere have not received much attention in studies on learning communities. Similarly, in working-life contexts positive relationships have been emphasised from the perspective of workers' well-being and satisfaction, but not so much from the perspective of promoting collaborative creativity.

Another condition for creativity, and one which has not so far been satisfactorily addressed in studies on creative collaboration, concerns power relations. Our subjects reported that unequal power relations and inequality between group members constituted major obstacles to collaborative creativity. Students reported the following as obstacles: '*a section of the group dominated the discussion*' (Session I), '*a change in the power relations within the group*' (Session IV). Another student reported: '*In our democratic group, where one member (in this case Mary) has taken the leading role, this does not promote real deliberation on matters.*'

Intellectual obstacles reported included a lack of knowledge and competencies within the group, and difficulty surrounding the topic. Also mentioned was an absence of conceptualisations of the topic. Instead, group members were seen to be focusing too much on their own personal experiences. Sara evaluated as an obstacle to creativity the fact that '*the discussion always focused on one group member, thus not on the conceptual level, but too much on the personal level*'. In addition to these obstacles, some students saw as obstacles to group creativity the '*general discussion culture*' or specific features concerning the nature of the talk, for example '*too rapid or simultaneous talk*'. The role of the tutor was also mentioned as an obstacle in some comments.

The most frequent individual-level obstacle was reported simply as being a particular member of the group. There was usually further specification of the personal characteristics, behaviour or values of that person. Comments included '*strong ideological opinions*', or '*being afraid of or apologising for opinions because of the presence of one group member*'. Concerning their own feelings, negative affects such as fear, frustration and insecurity were mentioned. In addition, the '*lack of an individual voice*' and '*the dominance of one voice*' were seen as obstacles.

3.3. Resources for creative collaboration

On the basis of the students' evaluations of the five situations in terms of the given aspects of collaborative creativity, two extreme situations were selected: Session III (the weakest) and Session V (the richest). The criteria for these are given at the end of Section 3.1. The two extreme sessions were elaborated with a view to identifying the contextual conditions applying and the resources used in the sessions.

In order to first get an overview of the two situations, both of the researchers watched the video-tapings of the two sessions over and over again, the aim being to identify the general atmosphere and emotional aspects dominating the discussion culture of the sessions. In addition, the transcribed discussions of the sessions were read and re-read in order to focus on the contents and the participants' way of talking to each other. We addressed for example, who was speaking to whom, how widely different students participated the discussion, whether the mode of talking was disputational or harmonious, whether there was a culture of close listening; also the kinds of grounds the speakers appealed to in their argumentation. We thus focused on those conditions and resources of collaboration which have been suggested as representing the important conditions and resources for collaborative creativity (Littleton & Miell, 2004; Moran, in press; Mercer, 2000; Sawyer, 2003, 2007). From reading and re-reading the transcriptions of the discussions in the two sessions we also tried to understand the contents and meanings of the talk in such a way that we could extract the previous contextual aspects and resources belonging to the discussion. In this way we aimed to achieve a fuller understanding of the contextual resources, conditions and constraints surrounding creative collaboration. In the following paragraphs we shall illustrate the two sessions, giving a description of the general theme of the discussion taking place in the two sessions. In addition, some illustrations of the discourse in both sessions will be given. We shall first address the session that students evaluated as weakest, then the session they evaluated as best. After this we shall provide a summary and comparison of the characteristics identified.

In the students' accounts, the *weakest session* (III) in terms of collaborative creativity was characterised in terms of being the least in producing new ideas, the least in revealing contradictions and opposing views, and the least in constructing an elaborated understanding of the topic. Session III took place about 1 month after the start of the students' second year of studies. Thus, the group already had a history of working together for 1 year. However, the tutor had just started to work with the group, and had not had a shared experience of the first year of the group. The topic of the session was social interaction in the learning community, and the discussion mostly consisted of very critical talk on the problems of the students' own group interaction. The tone of the talk was very negative, in the sense that a great many negative feelings and experiences were expressed. During the session there was also an episode of strong disputation between two group members, each presenting an opposing viewpoint without being able to identify the other's perspective. The episode ended with the 'underdog' bursting into tears. After recovering from her distress at the end of the episode, the person said that she now had the same unhappy and helpless feelings that she had experienced in her classroom during the upper level of her comprehensive school.

The situation was emotionally highly charged and it included much talk of negative emotions, such as feelings of exclusion, a lack of trust and safety, inequality in power relations and a lack of positive feedback. The arguments were mostly grounded in the individual's personal experiences. The shared history of the group was not much used. If the group's history was

referred to, only negative aspects were highlighted: the lack of an inclusive atmosphere, the dominance of the powerful members, a lack of emotional scaffolding, a lack of trust and courage.

The nature of the talk in this situation was mostly disputational (Mercer, 1996). Those individuals who felt excluded and had minor participation in the group presented critical comments on the functioning and atmosphere of the group, and those who belonged to the unofficial 'power group' spoke up on behalf of the group. The power-group subjects could not understand that the less-participating subjects did not feel safe or comfortable. Their comments reveal that they interpreted the reasons for the negative group experiences as lying in the complaining subjects' own behaviour, not as a matter of the way the group functioned. In the following extract this was manifested in Kathy's answers to Jane, Timothy and Diana. The situation started with a minor-participation member explaining how important the group atmosphere was for participation.

> Jane: *So, I think that the group atmosphere has a very important influence on how you dare to enter into the discussion, so I think that it's a very essential issue, the culture of the dialogue. . .so you get the experience that you are accepted and then you feel that you are important, and such a good atmosphere is important even if you are not looked at positively, it has an amazing influence on how you too can contribute something. . .*

> Timothy: *I also feel that often here, if somebody says something, people are soon rushing to explain it away. Then, between a few people, there's a lively exchange of opinions so that one can't chip in and say something . . . So I feel that the interpretation arrived at by these few people then comes dominant, because it's felt that a person's own opinion is threatened, and then it's explained away. And when somebody receives much more time for speaking, it's also bound to have an influence on the decisions and on how all matters are interpreted in this group.*

> Kathy: *But does that come from a lack of trust and courage, for example, in the kind of situation where somebody has the experience that the situation is now running away from them, and [there's] the one who can cope well with the situation and the other who disagrees, [but] can't say so. At least I [myself] would be able to manage in such a situation.*

> Diana: *I know that you would be able to, but there are individuals who feel that they don't belong to this group, and they aren't feeling good in this group. So, how could you go into such situation and say 'please, don't . . ., could you please, be kind to me.' You can't go ahead and say this.*

> Kathy: *At least I would be willing to say so!*

> Diana: *But when you try to say 'would you please be kinder to me' then comes the answer 'we are actually very kind to you, so why do you complain?' So, this is my interpretation of how. . .[bursts into tears]. . .one is not interested, one has no energy, one isn't able to. . .[weeping]*

> Kathy: *But it might be. . .OK. . .I just have the experience that. . .*

In the previous dialogue group members could not use empathetic solidarity as the resource for emotional scaffolding and for constructing mutual understanding. A safe and positive atmosphere was missing, and instead there was a clear struggle between opposing points of view. The members did not utilise each other's experiences as resources for analysing their group situation. The negative experiences and feelings experienced by Jane, Timothy and Diana were rejected and disregarded in Kathy's talk. For these feelings to become resources for creativity in the group discussion, they should have utilised for the creation of an elaborated and multifaceted understanding of the group situation. What emerged instead were polarised opinions. Because of the lack of a shared understanding concerning the group's functioning, the discussion could not produce new and creative ways to improve the group dynamics.

Hence, the situation could not provide with the necessary resources for collaborative creativity. Since the tutor was not sufficiently familiar with the group history, she was also unable to provide productive scaffolding. Nor did the situation demonstrate the use of members' resources as manifested in their experiences during the history of the group, although these experiences were presented.

The previous situation continued with a somewhat similar, but less fraught interaction between two group members (Lisa and Jane). In her talk, Lisa tried to be conciliatory in the situation, but also put a counter-argument to Jane. Lisa, responding to Jane, said: '*if those who feel that their suggestions are invalidated conclude such a thing from one member's opinion, it doesn't mean that the whole group agrees with it—even if the others haven't said anything*'. Lisa's talk was perceived as constructive by Jane, and she explained how she was also starting to learn that other members' silence should not be interpreted as a negative response. In their mutual talk, Lisa and Jane showed some empathetic solidarity with each other. It also seemed that Lisa's argument had helped Jane to change her opinion that the whole group was against her. Thus Lisa's and Jane's exchange was productive in terms of leading to a shared understanding between the two.

After this Kathy came to the question of the participants' differing experiences in the group, saying that there really were different kinds of conceptions and feelings within the group. Kathy further said: '*here there may be about four members who have a certain conception of our group, and these persons have good feelings, and then some members have bad feelings*.' As a reason for this Kathy mentioned '*the lack of time to speak about how we feel about the decision-making and dialogue in the group*'. Kathy thus found the reason in external matters, such as the lack of time, although just a few minutes previously there had been a good deal of talk about certain member's feelings. However, Kathy could not 'hear' these comments because she was so actively rebuffing them.

The *best situation* in terms of students' accounts of creativity was the last Session (V). In this session, the discussion concerned the group composition and the departure of one member of the group. In the course of the discussion, the group addressed the question of how it should deal with the situation in which one member had been absent for long time and was probably about to leave the group. The discussion took place at the end of the second year of studies, and it was in many respects very different from the discussion that had taken place in the 'weakest' situation.

Although there were different opinions concerning the matter to be discussed, they were not in opposition to each other; rather, they enriched the discussion while at the same time creating a multidimensional understanding of the matter. This was also demonstrated by the fact that there was no dispute between two particular members of the group as there had been in the weakest situation; in fact, the group functioned very inclusively in incorporating all members into the discourse. The participants' talk was also largely constructed in a way that grounded it in, or at least referred to, previous talk. In particular, one member (Mary) demonstrated a highly reflective stance regarding her own opinions. She also showed empathetic solidarity very explicitly to two minor-participation persons in the group. Lisa, who had often unofficially taken the role of the tutor, now abandoned this role and actively asked the real tutor for her opinion. The tutor replied to Lisa's question, showing high-level emotional support by identifying explicitly with the absent person.

From the videotaped situation we could see that the mood of the conversation was intense and focused. The students' comments were fairly long and their arguments well grounded. In addition, non-verbal gestures demonstrated that the students were carefully listening to each other, and showing respect to what others said. The topic of the session was emotionally highly charged, since it addressed the question of the inclusion/exclusion of one group member. The session started with a long comment by Kathy, in which she referred many times to the shared history of the group, taking the grounds of her argument from shared experiences. Furthermore, the reasons for one member's long absence and probable departure from the group were sought from group history. Kathy pondered further on how the group atmosphere had changed after the person in question had left. Mary continued with a long and highly reflective speech where she inclusively referred to previous comments, made by Jane, Fanny, Kathy, and Karen. Such comments are illustrated in the following episode:

> Mary: *So, neither do I have totally strict or rigid opinions about this, but then, when Jane said 'please, don't put the problem down to me'—there are also others who have a similar opinion. So if I'm being totally honest, if I think quite egocentrically, then I feel a lot more comfortable here now. But this feeling that I have is also connected with a lot of other things besides this studying, so I wouldn't like to reflect it into this situation. . .*
>
> Fanny: *Yes, and that's true of both of us.*
>
> Mary: *So, definitely!*
>
> Fanny: *In that sense we're in the same situation.*
>
> Mary: *So, that. . .in that sense. But I have the experience that it's been something in the general atmosphere. I don't know whether it comes totally from that, or also from other reasons, but I think that the atmosphere here has been transformed in a more positive direction, and I don't know if I've got something to say that hasn't been said before here, but. . .*

Mary then started to reflect on the history of the group from the perspective of how it was connected with the absent person. On the basis of this she started to imagine the future of the group, in the event that absent person was about to leave finally, or alternatively, in the event that the person might be coming back. Mary suggested detailed scenarios deriving from the two options as they concerned the absent person's future working in the group. She analysed these options from the perspective of the group and from that of the person as well.

In their talk, the students pondered their opinions and motives from many angles, constructing a multidimensional understanding of the situation. The group discussion analysed the consequences of the choices, for example from the point of view of legislation: what were the individual student's rights, and what were the group's rights and responsibilities? They also considered the ethical issues connected with a person leaving or staying in the group. In their conclusions, the students formulated the dilemma as a matter of choosing between taking care of other people and taking care of oneself.

During the discussion, the group also reflectively evaluated itself. Towards the end of the discussion, the group turned to their tutor. Lisa asked the tutor's opinion: '*What do you think Anna, as the tutor – although in a way it might not be easy to answer – should this kind of group, so to speak, try to struggle very hard until the end and leave no stone unturned, or is it too easy for us just to exclude a member. . .*'In contrast to the weakest creativity situation, at this point the group actively utilised the tutor's resources. The tutor's answer to the question further demonstrated emotional support; the tutor identified with the position of the absent student and spoke in his voice. In her answer to Lisa, the tutor states:

> *'So, the way I see it, I don't believe that the absent student will come back. That's the reason why I wouldn't like to start to do something, because I think it's unnecessary for me to start thinking about the issue very much. So I'll take up the situation when it comes in front of me, then I'll see. So I think, somehow, if I think of myself as being in the position of Diana [the absent student], then I think it would be very difficult to come back.'*

To sum up, the following characteristics can be found in the collaborative discourse under study:

In the weakest situation:

- The group atmosphere is emotionally charged in a negative sense;
- The group members have an opposing stance with regard to each other's talk;
- Most of the talk takes place between disputing pairs;
- Individuals express many negative feelings, including negative criticism towards the group;
- Much use is made of experiences from the individual's own history;
- There is not much mutual "care taking";
- Emotional support is rare;
- The tutor's resources are not utilised.

In the richest situation;

- The group atmosphere is characterised by a focused and concentrated mood;
- The group members carefully listen to each other;
- The group members refer in a positive and inclusive way to each other's talk, thus taking it explicitly as a resource for their own talk;
- The group history is much used as a resource in the discussion;
- Alternative future scenarios are constructed, and their consequences are imagined;
- A reflective stance regarding one's own opinion is apparent;
- Emotional support is constructed between students;
- The tutor's resources are utilised while deliberating on difficult issues;
- The tutor provides emotional scaffolding through identifying with the absent person's perspective.

On the basis of the comparison, we can understand that the conditions and resources for creative collaboration did not exist in the weakest situation. By contrast, in the richest situation, the most important ingredients for creative collaboration were present.

4. Discussion and conclusions

At an intellectual level, our findings demonstrated the importance of complementarity in long-term collaborative relationships, as emphasised also by John-Steiner (2000). A comparison of the weakest and best situation showed that they were very different in terms of whether other people's talk was used, and whether such talk was taken as a productive resource for constructing a multidimensional understanding of the topic. Whereas in the weakest situation the group members did not display complementarity in their dialogue, in the best situation they constructed their dialogue in precisely this way, referring to each other's talk in an inclusive and positive way, and building their own talk on previous talk. In the weakest situation, by contrast, opposing pairs tried to invalidate each other's talk; hence opinions were not used as a resource which would critically enrich the total picture of the phenomenon. In the worst situation, a group member tried to defend the group by invalidating another member's mention of his or her personal experience. In such a dichotomised composition it was not possible to construct a multidimensional picture of the complex topics addressed in discussion. Neither did such a dichotomised configuration allow the use of all the participants' resources. Instead the focus tended to be reduced to a matter of opposing poles. Such a reduction to 'black or white' does not promote creative collaboration. In addition, creativity in the worst situation was suppressed by an emotionally negative atmosphere that subjects perceived as threatening to their psychological safety.

Although the intellectual and emotional tensions existing in the 'worst' situation inhibited creativity, this does not mean that tensions between different views would never be useful for creative collaboration. Indeed, tensions are always present in creative collaboration. As mentioned previously, productive collaboration does not necessarily mean an absence of tension, but rather the fruitful cultivation of tension (Moran & John-Steiner, 2004). Tensions exist between vulnerability and security, doing and getting gone, jumping in and stepping back. Collaborators' personal differences are not eliminated, but are preferably taken advantage of as a mechanism for bringing out the latent opportunities lying within the domain (Moran & John-Steiner, 2004, p.12).

Our findings indicate that such tensions exist in all group situations. They were manifested in our subjects' accounts of the obstacles to productive collaboration—in particular the emotional atmosphere, since an insecure and negative atmosphere was seen as the most common obstacle to creativity. Tensions were also perceived in terms of unequal power relations, again seen as a very common obstacle to creative collaboration. Within our learning community the participants shared the conception that there had been an unofficial power group consisting of 3–4 persons. These persons had, in a previous analysis, shown themselves to be highly involved participants (Eteläpelto et al., 2005), people who had taken on a managerial and tutoring role in the group. From the 'worst situation' it appeared that these highly involved participants strongly identified with the group, in such a way that they were immediately willing to defend the group from its critics.

In addition to these group-level tensions, individual-level obstacles also demonstrated tensions within the group. As the most important obstacles for creative collaboration many of our students mentioned an individual group member, referring to

his or her behaviour, attitudes, opinions or other characteristics. This implies that there were considerable tensions between group members. This was most visible in the 'worst' situation; here the tension between two members did not move towards a solution, and there was no fruitful cultivation of tensions in the manner advocated by Moran and John-Steiner (2004).

Overall, our findings demonstrate that from the perspective of creativity, emotional and affective aspects are indeed highly significant in an intensive long-term learning community. This is in line with prior research on the role of emotional aspects for creative collaboration (John-Steiner, 2004; Littleton & Miell, 2004; Moran & John-Steiner, 2004; Storey & Joubert, 2004). Moreover, from our data it appears that if creativity is to take place, the atmosphere needs to be emotionally positive. This was demonstrated by a comparison of the worst and best situation, both of which were emotionally highly charged. In the worst situation negative emotions such as fear and a lack of safety were dominant, whereas in the best situation, although it was a tough situation for the group to confront, many positive emotions were apparent, such as solidarity and an acceptance of each other's opinions.

Our experience of a creative long-term learning community within the context of university teacher education has revealed that such communities represent very challenging endeavours in practice. In theory it would seem an excellent idea that teacher students would learn to construct productive learning communities by working in such learning communities themselves. In this way students should be able to become aware of the resources provided by such long-term learning communities, which are in many respect similar to classroom contexts or to teachers' own professional communities. Nevertheless, serious challenges to students' learning from their own community arise from two major issues illustrated in this study. These concern first, the individual participants' deep emotional involvement with the community, and second, the power relations within the community. Emotional involvement was illustrated by the emotionally highly charged learning situations and consequent tensions between group members, which made it very difficult to take a reflective stance towards the tensions in the community. Unofficial power relations may function in such a way that they act against necessary changes in-group dynamics.

In a long-term learning community, emotional involvement and power relations can indeed function as important resources for participant's learning and commitment to the group. They also represent the shared history of the group—an aspect that appears to be the most important resource for creative collaboration. However, if we are to take full advantage of such a learning community, in which students act as agents of their own learning and development, we need more research on the role and influence of power relations within communities of this kind. In our case, unequal power relations emerged as particularly harmful from the perspective of creative collaboration in that sense that it seemed to act as an obstacle for collaborative creativity.

Acknowledgements

Appendix A

In the questionnaire, the students were asked to answer the following questions addressing collaborative creativity:

(a) Did the group discussion create new ideas?
(b) Were alternative views expressed during the discussion?
(c) Did the discussion reveal contradictions and opposing views concerning different meanings connected with the topic?
(d) Did the discussion construct an elaborated and multifaceted understanding of the topic?

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