

In an ICT-based teacher-education context: why was our group ‘the magic group’?

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This article deals with a group of distance learning student teachers, who, after the course was completed, called themselves ‘The Magic Group’. The concept ‘magic’ refers to the reflective and productive learning process the group members experienced, a process far beyond their individual borders. The collaborative process was conducted by means of portfolio, peer learning through feedback and LMS (Learning Management System). The aim of the article is to focus on the most important assumptions for the group’s successful learning process.

Cet article porte l’attention sur un groupe d’étudiants en formation d’enseignants en ligne qui, après les études, s’est appelé ‘Le groupe magique’. Le concept ‘magique’ se réfère à l’aspect réflexif et productif du processus d’apprentissage tel qu’il a été ressenti par les participants, ce processus ayant dépassé de loin leurs capacités individuelles d’apprentissage. Le processus collaboratif a été mené à l’aide de portfolio, de tutorat entre étudiants et d’une plate-forme LMS (Learning Management System). L’objectif de l’article est de mettre en évidence les principaux facteurs qui auraient contribué à la réussite du processus d’apprentissage.

Este artículo trata de un grupo de estudiantes que están estudiando métodos de enseñanza por la red y preparando para ser profesores. Después de haber realizado sus estudios el grupo se llama ‘El grupo mágico’. La palabra ‘mágico’ hace referencia a la experiencia del grupo de un proceso de aprendizaje, productivo y reflexivo, un proceso que rebasó las posibilidades de cada estudiante individual. El proceso de colaboración se compuso de portafolios y de consejos y consultas de los compañeros estudiantes por medio de la red y de un programa de LMS (Learning Management System). Este artículo tiene el propósito de enfocar a los aspectos más importantes para el aprendizaje muy bueno de ‘El grupo mágico’.

Dieser Artikel handelt vom Fernstudium einer Referendarengruppe, die sich nach Abschluss des Kurses als ‘The Magic Group’ bezeichnete. Der Ausdruck ‘magic’ bezieht sich auf den reflektierenden und produktiven Lernvorgang, den die Gruppe erlebte, und der die Grenzen von dem, was sie als Einzelne erreicht hätten, weit übertraf. Arbeitsweisen bei dieser Zusammenarbeit waren der Einsatz von Portfolio, Lernen durch Feedback von Mits Studierenden, sowie LMS (Learning Management System). Die Absicht des vorliegenden Artikels ist, die wichtigsten Voraussetzungen für den erfolgreichen Arbeitsprozess der Gruppe zu beleuchten.

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Introduction

There are many different challenges for those whose job it is to educate teachers. One of them is to enable the students to reflect on their own values, beliefs and opinions as they relate to pedagogical theory and classroom practice. Consequently it is necessary for the educators to create suitable contexts for these reflections. Another important challenge for today's teacher educators, is to use artefacts from ICT and Learning Management systems to improve teacher education.

In spite of the fact that learning takes place when people collaborate, many students experience that team-work can be a difficult task. So far, primary emphasis in the research and practice of reflective teacher education has been placed on how individuals 'make sense of the phenomena of experiences that puzzle or perplex them' (Grimmett *et al.*, 1990, Manoucheri, 2002). Reflective practice methodology is built on two primary assumptions: firstly, that the teacher comes to realize the need to reflect; and secondly, that he knows how to engage in critical reflection. Further, reflection in itself is no guarantee for improved teaching skills (Zeichner, 1995; Zeichner & Wray, 2001).

The focus of this paper is to examine why this group of student teachers became 'magic' with focus on reflection, supported by teamwork and distance learning. The students worked as unqualified teachers during the two-year, net-based study programme. Completing the course, they referred to themselves as 'The Magic Group'. The word 'magic' in this connection refers to something not quite comprehensible to the members. The students experienced that they learnt more through the group-process than they would have learnt as individual students, and they associated this with a sense of the supernatural or mystical. Additionally, they all succeeded in their final exam. The five students experienced that their working situation as teachers had been positively influenced and improved. After completing the course, one of the students felt strongly that his teaching was less hit and miss because he was able to make more reflected choices and to argue his point of view. He felt he became more reflective both as a teacher and as a human being.

The aim of this article is to reveal the most important assumptions in the reflective learning process the group experienced, and to point out important consequences for teacher educators when planning new study programmes for distance-learning teacher students.

The importance of reflection

The ability to reflect is of essential importance for teachers if they are to learn from their experiences (Schön, 1987; Calderhead, 1989; LaBosky, 1994; Korthagen & Vasalos, 2005). The so-called ALACT-model, aiming at structured reflection, (Korthagen *et al.*, 2001) argues that reflection is necessary to promote sound professional behaviour and the development of growth competence for teachers and teacher students. The model is based on reflection on the four levels of environment, behaviour, competences, and beliefs. Beliefs are often deep-rooted and persistent (Calderhead & Robson, 1991; Korthagen & Vasalos, 2005), and therefore difficult to change.

What Korthagen calls ‘the onion-model’ represents an alternative to, or an extension of, the ALACT model (Korthagen & Vasalos, 2005). In addition to the four competences mentioned above, the concepts of professional identity and mission are added. Reflection on the level of mission triggers such issues as why the person has decided to become a teacher, or even what he sees as his calling in the world. It is concerned with what inspires us, and what gives meaning and significance to our lives (Korthagen & Vasalos, 2005). How then, can a distance-learning student teacher be challenged on his professional identity and mission?

Portfolios as support for reflection

Portfolios can be used to encourage the reflective process (Klenowski, 2002). The main aim of using portfolios in teacher education is to encourage students to think more deeply about their teaching, to become more conscious of the theories and assumptions that guide their practices, and to engage in collaborative dialogue about teaching. For portfolio implementation to be a success it must contribute to constructing personal knowledge and insights into performance, and possibly support competence development (Smith & Tillema, 1998, 2001). The learning process will be a result of the tri-fold interaction between constructing the portfolio, collaborating around the work, and the feedback process (Anderson & DeMuelle, 1998; Zeichner & Liston, 1998; Darling-Hammond & Snyder, 2000; Klenowski, 2002; Elminn & Elminn, 2005). However, it is necessary to look at the particular conditions under which the portfolios are constructed, and the purpose towards which they are directed. The framework supplied by the teacher educators is decisive for the students’ possibilities for reflection and collaboration. Most researchers who have studied the issue of teacher reflection and reflective teaching agree that reflection is not necessarily a good thing and does not automatically make one a better teacher. We need to learn more about the nature and quality of reflection that emerges under different conditions of portfolio use (Zeichner & Liston, 1998; Zeichner & Wray, 2001).

Therefore, an important task for the teacher educator is to design assignments or exercises for the portfolio that invite students to engage in reflection and argumentation. To a large extent the performance of the assignments defines what learning strategies the students will use. In earlier studies with children writing shared texts using a computer, it has been shown that it is possible to divide the children’s oral communication into three different categories depending on the performance of the exercises (Mercer & Fischer, 1997; Helleve, 2003). The three categories are called disputational talk, cumulative talk and explorative talk. Disputational talk means that the cooperation between the members breaks down, or that no real communication takes place. In cumulative and explorative talk, on the other hand, the group members share a basic confidence and there is a willingness to cooperate and share. Further division into additional categories therefore depends on the actual performance of the exercises. Cumulative talk means that the participants are asked to gain knowledge through accumulating shared knowledge. A statement from one of the members is confirmed by the others. The dialogue is thus

based on confirmations and repetitions. There is little room for the participants' own opinions, and therefore also limited learning potential. Explorative talk is also based on confidence and positive attitudes between the group members. In contradiction to cumulative talk, the explorative talk opens for discussions, dialogue and different opinions. The assignments ask for the participants' values and thoughts around questions of ethics. The members have to explain what they think, and argue why they think so, and they have to reflect on their own points of view. This is an argumentation or conflict based on trust and confidence. Explorative talk has therefore a greater learning potential, the potential of creating new knowledge.

ICT as a tool for collaborative reflection

CSCL (Computer Supported Collaborative Learning) deals with the interaction between the individual learner and the group (Lipponen, 2002; Koschmann, 1996), and it also addresses the fact that the social and cultural contexts are the objects of study, not computer technology as an isolated object (Salomon, 1995; Wertsch, 1998; Bruffee, 1999; Andriessen *et al.*, 2003). So how can ICT act as a support for a group of distance learning student teachers in their collaborative reflective processes? Actually the closed space in a learning management system (LMS) offers an extra room for teamwork, due to some important assumptions. Teamwork can develop in different directions. Normally we distinguish between two different concepts: cooperation and collaboration. Cooperation is product-oriented and the group members divide the work between themselves. Collaboration, on the other hand, means that the students work together on all the different parts of the common exercise (Salomon, 1995; Bruffee, 1999). They use the technology in active collaboration to create new, common and shared knowledge. According to Edwards and Mercer (1987), the development of common knowledge is simply two people knowing what just one of them knew initially. Through language we share our experiences with others and gain common knowledge. In order to obtain common knowledge we temporarily enter a socially-shared world of understanding (Rommetveit, 1974; Hoel, 1994, 2002). ICT offers extra space for this collaboration in a socially-shared world. CSCL-models challenge our notions of what learning and knowledge are all about. It can be maintained that learning is explained through what we call knowledge creation or knowledge advancement metaphor. In this perspective, learning is seen as analogous to innovative processes of inquiry where something new is created. The initial knowledge is either substantially enriched or significantly transformed during the process (Paavola *et al.*, 2005). The term argumentation is here understood as any form of collaborative activity that involves confronting cognitions and their foundations. Argumentation as referred to here is a language-based activity, and is looked upon as epistemic as well as semiotic. It is an epistemic activity since it involves expressing knowledge (Andriessen *et al.*, 2003).

The Geneva school, inspired by Piaget (1926, 1929), is grounded on the 'conflict perspective', the term 'conflict' referring to cognitive conflict. The socio-cognitive perspective stresses that conflict is an important element if learning is to occur

between equivalent participants (Foreman & Cazden, 1985). The Vygotsky-tradition, however, maintains that knowledge can also be developed between equals without any element of conflict. In both perspectives we speak about conflicts based on confidence and security.

Yrjö Engeström (1998) uses the concept of the 'zone of possibilities' as an equivalent to Vygotsky's 'zone of proximal development'. What Engeström wants to show is that people working cooperatively not only acquire existing knowledge, but that they also renew existing knowledge. He points to the human ability of renewal through creativity and play. In a socially-shared world of understanding, the members create a common zone of development. The 'interpretive zone' is an alternative concept (Wasser & Bresler, 1996; Hoel, 2002). This concept refers to the common interpretive processes we enter when we are engaged in collaboration with other people. Both the individual's personal zone and the group's common zone develop according to the process of interaction. For collaborative knowledge advancement to occur, it is important that ideas, practices, and conceptual artifacts are expansively transformed (Paavola *et al.*, 2005). According to Andriessen *et al.*, (2003), the field of CSCL research has reached the point where it needs to focus on learning from one particular type of collaborative activity, argumentation. Here, the concept of argumentation is understood as confronting cognitions and their foundations (Andriessen *et al.*, 2003).

Research questions

Collaboration and peer-response techniques are often used in schools and educational programmes, both for on-campus studies and for distance learning. Students work in different groups with varying results, however, little research has been done regarding such collaboration. In a socio-cultural perspective, learning takes place when people collaborate.

Collaboration in itself is neither efficient nor inefficient. Collaboration works under some conditions, and it is the aim of research to determine the conditions under which collaborative learning is efficient. [Dillenbourg *et al.*, 1996, p. 195]

For research purposes the relevant question is *under which contexts is collaboration successful?* This is the general background for this study, which focuses on the following research questions:

- What are the most important assumptions for the productive learning process that the 'magic group' experienced?
- What are the most important consequences for teacher educators in future planning of net-based study-programmes for distance learning teacher students?

Context of the study

The background for this study is a group of Norwegian distance learning students who recently completed a two-year, part-time teaching credential programme for

experienced practitioners. Most of the students had graduate-level university degrees in various subjects. They worked as teachers without qualifications, during the course. Most of them had many years' experience as teachers. They had worked at their respective schools for several years, but they could not get permanent jobs as teachers until they had taken the formal teacher education. In many cases the students were defined as 'good teachers' by the principal and colleagues, and they were teachers the school wanted to keep. Many of the students defined themselves as successful teachers. In the beginning many of them looked at the teacher education course as something they had to 'go through' in order to get a permanent job. They said that they knew what teaching was like, and that they doubted if they had anything to learn from the study programme.

With the exception of three brief seminars, two days at the beginning of each semester, the programme was entirely web-based. At the very beginning of the course all the students were gathered for three days, 'isolated' from the rest of the world. Altogether twenty students were divided into four groups. The groups were given the respectful names of Piaget, Vygotskij, Comenius and Dewey. The main aim of the initial meeting was to invest as much confidence as possible into the groups before the net-based work started. The students played together, they acted as teachers for each other, and they gave feedback to each other. They also learnt about the technology they were going to use, and were introduced to the electronic 'closed rooms' where they were going to publish their texts. Together with the students, the teacher made rules concerning collaboration, when the students were supposed to publish their texts, and to whom and when they were going to give feedback. The students were working as unqualified teachers during the two years. Connected to their studies, they had a mentor from their respective schools. With the exception of two weeks' experience from other schools, they did all their practice teaching in their own classes and school.

The students came from the Western part of Norway where they worked as teachers. They had their bachelor or master degrees in different subjects, and they were working either in primary, secondary or high schools. During the two-year course, the students were required to produce fifteen texts on various topics for their working portfolio. The teacher educators planned that most of the learning activity would take place in groups of five students within the LMS (learning management system) called Luvit. A Learning Management System is a broad term that is used for a wide range of systems that organise and provide access to online learning services for students, teachers and administrators. These systems usually include access control, provision of learning content, communication tools and organisation of user groups (Paulsen, 2002). Each group had their own closed room in the LMS that nobody other than the teacher could visit.

The portfolios they created were based on their texts and on critical feedback from the other group members. The texts were supposed to be published within the 'room'. The portfolio was compiled from assignments given by the teacher educators. Since all the students were working as teachers, it was possible to relate the exercises to their own practice in the classroom, as well as to the pedagogical

theory they were supposed to read. The students were asked to respond critically to texts written by two other students in their group. Based on a procedure decided by the teacher educator, each student gave feedback to two fellow students on each assignment. This meant that the students knew who was going to respond to their text next time. As the course progressed, the students compiled their working portfolios. The portfolio consisted of personal texts and feedback from other students. Each student's working portfolio was visible at all times in the group-room for the other four students. Except for the teacher educator, nobody else had insight into the room. At the end of the course each student selected texts for his or her final portfolio. The teacher educators gave feedback to the whole group after the peer feedback process was compiled, and not to the individual student.

After a few weeks, both the students and the teacher discovered that one of the groups, the Dewey group, was engaged in a more productive learning process than the other groups. They apparently spent more time on the writing process as well as on the feedback they gave to their peers' texts. They went deeper into the discussions during the feedback process than the other groups. Often the feedback resulted in a continuous dialogue between the two students.

The Dewey group consisted of three female and two male students, aged 25 to 45. In this paper they are given fictitious names: June, Jill, Sara, Tom and Peter. They lived in different geographical areas in Norway, so they only met a few times, and knew nothing more about each other, other than the information they received through the course. They taught different levels in different schools: Tom in a primary school; June in an international secondary school; and Peter, Jill and Sara in different high schools. They taught different subjects: Tom and Peter had studied science; June, Jill and Sara had studied Norwegian, languages and civics. One of the students, Sara, represented another national background than the other students.

Methodology

Since the members of the Dewey group agreed that their learning-process had been productive, I interviewed the group members after the study-course was finished, focusing on group-processes. The five students were asked why they viewed themselves as the 'magic group' and what they interpreted as the most important reasons for this. They were also asked what they had learnt from the reflection process they had gone through together, and what they considered the most important aspects for a successful learning-process related to the design of the study-programme.

All the interviews were semi-structured with several pre-prepared questions. The semi-structured design ensured that all the respondents were confronted with the same set of core questions. This was important for the reliability of the study. But in addition to the core questions, follow-up questions were formulated. These offered the interviewees the opportunity to introduce unexpected ideas and thoughts. All interviews were fully transcribed before the structural phase of the analysis.

Observations of the groups' feedback process were done regularly during the course of the programme. These observations focused on two different aspects. The

first aspect was whether or not the group members invested resources in reading and responding to the other students' texts. The second question focused on the performance of the assignments. Were they performed in a way that opened for different opinions related to values and attitudes, thereby leading to discussions and new knowledge? Or were they performed in a way that only invited the members to respond to given information? The observation material included fifteen assignments, which were analysed according to the above questions. Each group member created a written text in answer to the various assignments. Furthermore, the material included the peer feedback from each exercise each student received.

As part of their presentation portfolio the students were asked to write an essay reflecting their personal opinion of the learning process. In this paper they were supposed to write how they had experienced the interaction with the other students and teachers. They were also asked to say something about *if* and eventually *how* the study programme had changed their way of acting as teachers in the classroom. This material has also been used in the analysis. The results have been validated by one of the informants as a relevant description.

Findings

All of the group members mentioned the three-day seminar at the very beginning of the study as vitally important to the successful development of the group. Participation in the different activities enabled them to develop a kind of trust in relation to the other group members. Sara felt that there was an immediate 'click' in the groups' mutual acceptance. This feeling of security and confidence was basic and apparently developed during this first session. After the first six months of net-based studies and group work, the students met for the second time. Referring to this meeting, Tom said:

I had a strong feeling of coming home. This was *my* group. Or rather this was *our* group.

The most important aspects concerning interpersonal relations that seem to be important to the group are: mutual respect, engagement, obligation and sensibility. They all published their texts and gave feedback to each other keeping the deadline. If any of the members for whatever reason was prevented from presenting his or her text, they strongly felt an obligation to tell the other members the reason why. They also spent a lot of time reading the other members' texts and giving response. They went deep into the discussions and spent a lot of time reading what the other members had written. As Tom said:

Knowing that the other members spent a lot of time on my text I just had to do the same, otherwise I would never have done it.

Moreover, as a group, they all interrelated well. At the beginning they were afraid of being too honest with each other; it was safer to give superficial feedback that would not offend anybody, but gradually this changed.

All five members mention that there were two strong leaders in the group. The leadership was informal, but they all experienced that these two students defined the

benchmarks for the other members and for the quality of the work they invested. The leadership was accepted and appreciated by the other group members. An example of how this leadership became visible, was when one of the students after a short while decided that she wanted to be more direct and honest in her feedback than anybody had dared to be so far. Very soon this also affected the other students. This meant that they were more curious about reading the feedback from the others, and they immediately spent more time on their own feedback. The sensitivity was illustrated through the groups' ability to be honest and direct, and yet not be rude, a capability they had missed in other groups with which they had worked so far. They felt a great respect for the other members' opinions and experience.

Yet another example was the way the feedback process was organised. The group experienced that the rules given by the teacher educator did not function satisfactorily. When one of the informal leaders suggested other rules for the group, they changed. In the interview, Sara said that it was important for her not to know who would be responding for her text next. Referring to Bakhtin (1998), she said that when she wrote, she wrote for the group and the teacher as the receiver. If she had known who was going to read her text she would have addressed the text to him or her, and written a different text depending on who the reader was.

While the group appreciated similarity, they also stressed the importance of being different, mainly referring to the possibility of viewing different issues from different angles. The Dewey group represented different school districts and they worked with different age groups. They mentioned differences in age and gender as an important contribution to the positive learning process. One of the group members represented another national culture, and the rest of the group mentioned this as an important factor. The fact that they were teaching different subjects was also mentioned as a strength. But what seemed to be most important was the difference represented in attitudes and values. They experienced that they were challenged about their own fundamental opinions, and they really had to reflect on what they thought and why they thought so, and to argue for it.

The nature of the net-based discussion, as compared to real-life discussion, was visualized by June who expressed that she had to sharpen her thoughts and opinions on what the other students had written. She experienced much deeper conversations than if they had been sitting around a table because they could read long rows of thoughts that others had ruminated. They could compare their ideas to what the others had written. Often, they had responded to the same assignment differently. Unlike a face to face discussion, they had time to reflect upon the other members' responses before they gave feedback. They could read the feedback of the other members, and reflect and think before they responded which is very unlike an oral discussion where they would have to respond immediately.

What, then, are the most important reasons why the Dewey group became the 'magic group' as seen by the members? They all mentioned as very important that they had a basic trust before they started their net-based work. Moreover, they had two strong members who defined the benchmarks and set positive standards for the work. The group experienced that similarity as well as difference, was important for

successful collaboration. Similarity related to mutual respect, engagement, obligation and sensitivity; difference related to age, gender, geographical location, schools, age of pupils, subjects they were teaching, and nationality. But most of all they seemed to appreciate the fruitful and productive learning process they experienced when they were discussing with people who had different opinions when it came to beliefs, attitudes and values.

Different exercises lead to different learning-strategies

When analysing the learning processes going on within the Dewey group—producing texts, giving and receiving peer feedback and re-writing the texts for the final portfolio—I find it useful to use the same categories as in the study of children cooperating around text writing (Mercer & Fischer, 1997; Helleve, 2003). The three different categories, i.e. disputational talk, cumulative talk and explorative talk, mirror the learning-strategies the children used when they were discussing their exercises. Since the co-operation within the Dewey group was both virtual and written, I have changed the names of the categories to disputational, cumulative and explorative feedback. Disputational feedback describes groups where no or very little engagement and communication is taking place. In cumulative and explorative feedback, on the other hand, there is a basic trust between the group members, and a willingness to cooperate and share. The Dewey group experienced this basic trust. The learning strategies the group made use of, depended on the performance of the assignments.

Informative exercises offer cumulative feedback

Cumulative feedback indicates that an initiative from one of the participants is affirmatively followed up by the others. The group is accumulating and collecting common knowledge. An initiative from one of the participants is supported by the other, and the communication is characterised by repetition and confirmation. One student builds on what another has said. It is possible to ask questions, but there is relatively limited space for personal disagreement. I call these exercises ‘Informative assignments’. Here is an example of an informative assignment: ‘Please comment on one of two texts in your curriculum’.

Jill’s comments to Peter:

It was very interesting to read your text. You have a fine introduction where you tell the reader what you will discuss. I think you must have understood Hargreaves correctly. Like you, I am unable to see what he thinks a postmodern school should look like. As far as I understand Hargreaves he is concerned with describing the background for the schools’ challenges. He presents many paradoxes which describe postmodernism as a phenomenon as well as a challenge that schools in general, and especially the leaders, are facing.

Jill comments on the way Peter has perceived the question, and that is actually the only kind of feedback the assignment opens for.

Another example of informative assignment: ‘Choose one of the educationalists from our curriculum. Please make a brief survey of what he represents and discuss

the practical consequences of his theories. You may include your own experiences in your survey'. For this assignment, the student repeats or reconstructs what he has read. The following dialogue, where June comments on Tom's text, illustrates this type of assignment:

June's comments to Tom:

In spite of the fact you being a science teacher you really express yourself well. Your response highlights Piaget's theories in an easily read and interesting manner. A question for a biologist: Isn't it funny that these schemes are fairly constant while the stimuli our thoughts are exposed to are so different from culture to culture, age to age, and place to place? You don't mention anything about the child's home environment? Does Piaget mention anything about that? You write (page 5): 'Here the child's interests will have an effect'. What is affecting the interests? Culture? Family? Heredity? Can't everything appeal to everybody given the right conditions and the right moment? It seems like Piaget is so certain of his theory.

What happens here is that June, after reading Tom's text, gives him feedback partly by asking questions. Even though she agrees with him, her comments will probably help him in his reflection when he rewrites his text for the portfolio. But still the discussion is related to understanding Piaget and not to Tom's own opinions.

Cumulative feedback gives limited room for disagreement and reflection because it does not challenge the students' personal attitudes or values. June said about this kind of assignment:

You had to agree and repeat what the others said or just stop the whole conversation. There was no room for dialogue. It had to be a monologue. And I thought, 'Where is my place in this?' It was confusing.

Explorative feedback through creative assignments

Creative assignments, on the other hand, give the participants the opportunity to make personal statements and to disagree with each other. Explorative feedback has all the characteristics of cumulative feedback, but it additionally opens up for diverging opinions by asking for personal opinions, attitudes and values. I call these assignments 'creative assignments'. An example is the exercise, *The Norwegian unitary school system—one school for all? Please give your theoretical and personal opinion.*

Sara's comments to Jill:

Your text is well-written and interesting. I find it especially interesting that we have written about the same subject—comparing the Norwegian and the American school system. We agree and disagree on certain points. We agree on equal rights to education, and your personal examples stress this. This is a decisive point, but after this our disagreements begin. Perhaps we disagree due to our different cultural backgrounds? Anyway, it's incredibly instructive to discuss with someone one disagrees with. We both want the best system to win. And, as you say, Knowledge is something that grows and grows as you share it with others.

Sara's comments cover two pages of text. She points out how they disagree about children's abilities to handle response, the private school system, streaming pupils

according to their abilities, etc. Before writing her final text, Jill responded to Sara's feedback with an additional page of comments.

Some of the assignments were based on personal and ethical questions, such as: 'In the curriculum, Jan Gilje has written an article about the pedagogue's credo. What is your credo or pedagogical basis? Please give reasons for your point of view'. Here is an outline from the feedback:

Sara's comments to Peter:

Your last question, 'What potential is there for my kind of teacher in the future?' was brilliant. I hadn't realised that the exercise opened for this kind of reflection, but Gilje's instrumental way of using the concept 'credo' of course leads to fruitful reflection, as you have illustrated. I think you should have extended the text to include the biologist's view on life. You biologists command one of the subjects that deal with our basic opinions about life, and your philosophies and personal credos have the capability of greatly influencing coming generations. It is absolutely in place to reveal your attitudes and opinions in such an exercise.

Peter is challenged to say more about his philosophy on life and death as a biologist, and in his response he thanks Sara for making him aware of this. Here is another example of a question that leads to explorative feedback: *Is teaching a vocation for which you do not need any formal education? In your opinion, what is a professional teacher? Please give theoretical reasons for your answers.*

Here is an excerpt from a feedback Sara received from June:

My subjects are English and psychology. All of the aims in the national curriculum for psychology have been formulated as problems, problems that allow for broad and creative interpretations. The same with English—the goals are general and diffuse, and give lots of room for aesthetic interpretation. In other words, my experience with the national curriculum is positive; I simply can't understand how it can be experienced as a strait-jacket. In this part of your text you should perhaps address this, and give examples of how target and goal-oriented teaching compels the teacher to become less creative or aesthetically-oriented. I admit that I have little insight into the national curriculum for other subjects, but are they so different?

June disagrees with Sara and challenges her opinions. Explorative feedback, which results from creative assignments such as the one above, gives rise to and opens up for critical questions and objective disagreement, and leads to new, common knowledge. These possibilities are not attainable within the limits of informative assignments and cumulative response.

Some of the students said that this kind of assignment should have been placed at the beginning of the study because it forced them to 'open up'. They had to show the other group members who they were, what they thought, and what was important to them. Another student answers the same question by asking if it was perhaps right to start with the informative assignments, because it led to a feeling of security and confidence when they started talking together about non-threatening issues.

So what are the most important findings concerning the performance of the assignments? Firstly, it is possible to divide the material into two different categories; informative and creative assignments. The informative assignments ask the students to collect information. The creative assignments also ask the students for

information, but in addition they challenge the students' personal opinions and values. They have to reflect and argue. Secondly, the performance of the assignments has immediate consequences for what kind of feedback the other students are going to give to each other. The informative assignments lead to cumulative feedback. The creative assignments on the other hand are open to explorative feedback. The students disagree with each other and discuss their deepest beliefs, professional identity, and mission. New knowledge is constructed when the students discuss with people they disagree with.

Discussion

This study, although limited in its generalisability, raises important issues for teacher educators. The study investigates the most important assumptions underlying a productive learning process a distance-learning group of teacher students experienced.

It exemplifies that peer discourse in an ICT-based, teacher education context can lead to deep reflection and productive learning processes. The members of the 'magic group' experienced that their deepest values, their professional identity and mission were provoked (Korthagen & Vasalos, 2005). Deep reflection was made possible through the construction of the portfolio, the collaboration and the feedback process. Sara says in the interview that she thought of the other group-members' opinions as guests. She felt like opening up and inviting the guests inside. And then she thought, 'What do the guests want from me? Will they be staying forever in my head, or will they disappear?' And from that point of view she gave feedback to the other students' texts, like guests. Jill said she did not think she had changed her fundamental opinions, but the other members' different opinions gave her a more nuanced way of understanding.

What, then, are the most important reasons contributing to the productive learning process as experienced by the students, and what are the important consequences and implications for teacher educators? All the students stress the basic confidence within the group. Through the first physical meeting they learnt to trust each other. They felt deep respect for each other, and consequently mutual obligation and responsibility. Furthermore, they experienced the difference in values and attitudes to be fruitful. In their continuous feedback process there were elements of conflict, but the disagreements were founded on trust and security (Mercer & Fisher, 1997; Helleve, 2003). For the students, the greatest learning potential seems to lie in the feedback process. When they wrote their final texts for the portfolio, they had to reflect upon their own points of view, and on the feedback process and the other members' opinions. The distance in space and time made deeper reflection possible than in a face to face discussion.

This study shows that it is possible for students to experience that their personal zone develops as a result of the interaction process and in a way that transforms practice as well as personal opinions (Engeström, 1998; Koschmann, 2004).

The first implication for the teacher educator is to contribute to building a confident learning society for a small group of students. Secondly, the teacher

educator needs to take into account what the students report, and assure that the small, confident group should be similar in relation to mutual respect and obligations, but different when it comes to experiences and values. Thirdly, the study highlights that the assignments connected to the portfolio are decisive for the learning process. If the students are asked to collect information, as in the informative assignments, there is limited or no room at all for disagreement, argumentation and reflection. During feedback the student has to agree or confirm what has already been said. Knowledge or information is collected in cumulative assignments. In the creative assignments, on the other hand, the students are asked to reveal their own opinions, attitudes and values. They are exploring the zone of possibilities (Engeström, 1998) and creating new knowledge (Paavola *et al.*, 2005). Jill said that she had never been so well taken care of in any study programme so far: Continuously she got feedback on what she wrote, said and did, and this process forced her to feel committed. She always had to think.

Fourthly, the findings suggest that the teacher educator should maintain strict rules for the work with the portfolio. The students should know that the teacher is the only one outside the group who can read the texts. Moreover, it is also important that the teacher comments to the whole group and not to the individual student. The teacher is watching the process and is closely involved and cares, even if the students are doing most of the work on their own.

Conclusion

Regarding the students, the greatest learning potential seems to lie in reflection and argumentation with peers they trust, but with whom they can still disagree. The CSCL environment is designed to stimulate and support a constructive debate through argumentation in a learning society. Portfolios seem to be a suitable tool for an argumentation process that can lead to deep reflection and new knowledge. But reflection, argumentation and portfolios are not enough in themselves. It is the teacher educator who is responsible for the design of the programme who binds it all together. It is his or her responsibility to care for the composition of the groups and the design of the portfolio. If the students are supposed to reflect upon their own values and beliefs as related to classroom activities, it is necessary to plan creative assignments that can challenge the students and lead to explorative feedback.

Notes on contributor

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Appendix

Core questions for the interview

1. Can you please describe the learning process in the Dewey group as you experienced it?
2. What do you look upon as the most important reasons for the successful learning process of the group?
3. What were the most important aspects of your own personal reflection process related to your work as a teacher?
4. What should be your most important advices for future design of on-line teacher education?

Assignments of the portfolio

1. *Please describe and give your reasons for one lesson (or a longer period) you are going to teach in the future.*
 - a. Who are you going to teach?
 - b. What are you going to teach?

- c. How are you going to do it?
 - d. Why are you going to do it like this? (Reasons for aim/content/method).
 - e. You are supposed to use theoretical statements as well as personal.
 - f. Tell the group what you want them to give feedback to.
2. *Choose one of the educationalists from our curriculum. Please make a brief survey of what he/she represents and discuss the practical consequences of the theories. You may include your own experiences in your survey.*
 3. *The professional teacher*
 - a. Quotations and statements from different educationalists and politicians. What is your opinion?
 4. *Case-study of one pupil*
 - a. Please describe a pupil based on your own observations. You may as well discuss your observations with the pupil himself/herself.
 - b. What are your challenges as a teacher meeting this pupil?
 - c. Please give theoretical and personal reasons for how you will do this.
 - d. Later you will be asked to reflect upon the results of your decisions.
 5. *The Norwegian unitary school system—one school for all?*
 - a. Please give your theoretical and personal opinion.
 6. *The different functions of the school*
 - a. Describe the schools' different functions. Discuss these functions related to each other, highlighted by the National Curriculum's aim of developing the integrated human being.
 7. *In your opinion; what is good, and what might be better in the school as you know it from practice and through the curriculum?*
 - a. Please describe and give reasons for your ideal school.
 - b. How would you make such a school a reality?
 8. *In the curriculum, Jan Gilje has written an article about the pedagogue's credo. What is your credo or pedagogical basis? Please give reasons for your point of view.*
 9. *Case-study of one pupil*
 - a. In assignment no. 4 you were asked to describe your challenges concerning one pupil and to describe your plans for his/her education.
 - b. How did it all turn out?
 - c. What are your reflections looking back?
 10. *Choose one of the educationalists from our curriculum.*
 - a. Please make a brief survey of what he represents and discuss the practical consequences of his theories.
 - b. You may include your own experiences in your survey.
 11. *Please give an interpretation for the concepts school development and school assessment.*

- a. Please characterise the school of today as you know it, related to these two concepts highlighted by theory.
 - b. What kind of change will you argue for and why?
12. *Please describe an ethical dilemma as a case from your own practice.*
- a. What is the dilemma?
 - b. How did you choose to meet it?
 - c. What are your reasons for the choice?
 - d. Do you think otherwise now?
13. *Please give a description of one of the following working methods: project, story-line or collaborative learning.*
- a. What is the theoretical background for this method?
 - b. What do you look upon as strong and weak points concerning this method?
14. *Give your interpretation of the concept 'The inclusive school'.*
- a. In what manner have you experienced the school as inclusive as pupil and/or teacher?
 - b. What in your opinion are the most important challenges for succeeding?
15. *'I am a teacher'*
- a. Is teaching a vocation for which you do not need any formal education?
 - b. In your opinion, what is a professional teacher?
 - c. Please give theoretical reasons for your answers.

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