

*Til foreldrene i klasse _____ ved
_____ skole.*

Jeg er for tida hovudfagsstudent i pedagogikk ved Universitetet i Bergen. I hovedfagsoppgaven min, er jeg interessert i å se nærmere på prosjektet "Tekstskaping på datamaskin" som klasse _____ er med på.

Det jeg særlig vil fokusere på, er samspillet og læringsprosessene som utspiller seg når elevene bruker data i den første lese- og skriveopplæringa. Jeg er også interessert i å se hvordan jenter og gutter i denne alderen forholder seg til datamaskina som arbeidsredskap.

For å kunne finne ut noe om dette, er det nødvendig for meg å observere hva som skjer foran datamaskina når elevene lager tekster. Observasjonene må foregå over noen uker. Jeg vil dessuten ha gruppeintervju med barna, og det kan bli aktuelt å benytte lydbånd og video-opptak fra undervisningen. Jeg vil selvfølgelig sikre at elevene får full anonymitet når jeg rapporterer fra det jeg finner i klassene. For å kunne gjennomføre disse observasjonene trenger jeg tillatelse fra dere.

Jeg har søkt, og fått tillatelse fra Datatilsynet under forutsetning av at datamateriellet slettes når oppgaven er ferdig, og at dere som foreldre er informert om at dere når som helst kan trekke barna fra undersøkelsen.

Når resultatene er klare, vil jeg gjerne dele dem med dere som foreldre i klassen.

Håper på positivt svar innen _____ i vedlagt svarkonvolutt.

Med hilsen

Ingrid Helleve.

Vi gir tillatelse til at det blir gjort observasjoner i klasse _____

Dato _____ Navn: _____



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Dato
15.09.2000

KONSESJON TIL Å OPPRETTE PERSONREGISTER IHT RAMMEKONSESJONSORDNINGEN FOR UNIVERSITETET I BERGEN

Datatilsynet har mottatt Deres melding innkommet til oss den 23.08.2000 om opprettelse av personregister i forbindelse med prosjektet "Samspel med data?".

Vi har gjennomgått materialet og gir Dem med hjemmel i personregisterloven § 9, herved tillatelse til å føre det ovennevnte register, og å innhente opplysninger som er gitt i meldingen.

Datatilsynet vil påpeke følgende. Det bør i informasjonsskrivet til foreldrene informeres om at opplysningene skal samles inn ved gruppeintervjuer, og at det skal benyttes både lydbåndopptak og videoopptak i tillegg til observasjoner. Foreldrene må også gis informasjon om at de når som helst kan trekke barna fra undersøkelsen.

Som registeransvarlig oppnevnes Olga Dysthe.

Prosjektleder er Ingrid Helleve.

Datatilsynets tillatelse er gitt på følgende vilkår:

- at betingelsene i rammekonsesjonen for Universitetet i Bergen blir fulgt.
- at første gangs kontakt opprettes gjennom skolen.
- at personidentifiserbare opplysninger ikke registreres ved hjelp av edb. Det elektroniske register kan inneholde et referansenummer som knytter seg til en manuell navneliste. Denne forutsettes oppbevart adskilt fra det elektroniske register og forsvarlig nedlåst i arkivskap.
- at det innhentes aktivt informert samtykke for alle deler av undersøkelsen. Det forutsettes at samtykket fra respondenten er reelt. Samtykket skal også omfatte en eventuell lagring etter prosjektavslutning i personidentifiserbar form.

- at lydbånd og videoopptak oppbevares på forsvarlig måte og nedlåst i arkivskap når de ikke er i bruk.
- at det i informasjonen til respondenten klart kommer fram at undersøkelsen er frivillig, og at vedkommende kan trekke seg fra undersøkelsen på et hvilket som helst tidspunkt.
- at det innsamlete materialet slettes/anonymiseres ved prosjektavslutning, senest 31.12.2000.

Dersom prosjektleder ønsker å oppbevare opplysningene i personidentifiserbar form etter prosjektslutt, må arkiveringsspørsmålet først legges frem for Rådet for persondataarkivering i god tid før prosjektavslutning, før spørsmålet igjen forelegges Datatilsynet for avgjørelse.

Med hilsen


Therese Fevang (ef)
rådgiver


Beate Sire Dagslet.
førstekonsulent

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Institutt for utdanning og helse
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Vår dato: 02.07.2007

Vår ref :16903/SF

Deres dato:

Deres ref:

KVITTERING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 15.05.2007. Meldingen gjelder prosjektet:

16903	<i>Produktive interaksjoner i IKT-støtta læring</i>
Behandlingsansvarlig	<i>Universitetet i Bergen, ved institusjonens øverste leder</i>
Daglig ansvarlig	<i>Ingrid Helleve</i>

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

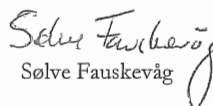
Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, <http://www.nsd.uib.no/personvern/endrings skjema>. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://www.nsd.uib.no/personvern/register/>

Personvernombudet vil ved prosjektets avslutning, 31.12.2009, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen


Vigdis Namtvedt Kvalheim


Sølve Fauskevåg

Kontaktperson: Sølve Fauskevåg tlf: 55 58 25 83

Vedlegg: Prosjektvurdering

Spørsmål til elevane.

- Når eg seier ordet datamaskin, kva tenkjer du på då?
- Likar du å skrive på data?
- Brukar du datamaskina heime?
- Kvifor trur du Rita vil at de skal skrive sammen?
- Kva er best ved å samarbeide på data?
- Ka vil det si å samarbeide?
- Kva er dumt med å skrive sammen?
- Kva hender dersom begge har idear samtidig?
- Korleis blir de einige om kva de skal skrive?
- Er det skilnad på kven du skriv sammen med?
- Kven likar du best å skrive med?
- Er det skilnad på jenter og gutar i forhold til å like å skrive på data?
- Korleis?
- Når du treng hjelp, kven spør du da?
- Kva har du lært av å skrive på data?
- Ka likar du best å halde på med på skulen?

Intervjuguide.

Innleiing med alder, utdanning, tidspunkt for utdanning etc.

-Kva var årsaka til at du ville delta i prosjektet "Tekstskaping på data?"

-Har du erfaring med andre former for lese- skriveopplæring?

-Kva bakgrunnskunnskap har du om emnet?

-Kva forhold har du til datamaskiner?

-Bakgrunn-utdanning innan IKT.

-Kva opplever du som dei viktigaste erfaringane dine så langt?

-Kva opplever du som det viktigaste ved lærarrolla?

-Kva haldningar til dataskrivninga møter du frå andre lærarar?

I personalet

I leiinga på skulen

Andre.

-Kva haldningar møter du hjå foreldra?

-Kva går eventuelle motførestillingar ut på?

-Kva oppfattar du som dei viktigaste årsakene til motførestillingane?

-Er det ulikskap i oppfatningar med omsyn til kjønn?

-Korleis opplever du klassen din?

-Kven er det som dominerer? Jenter, gutar ?

- Korleis opplever du samspelet deira framfor datamaskina?

- Kva ser du på som viktige faktorar for å få til god samhandling framfor datamaskina?

-Ser du skilnad på jenter og gutar når det gjeld å bruke datamaskina som reidskap?

-Kva går den eventuelle skilnaden ut på?

-Korleis opplever du lærarrolla når elevane brukar datamaskin i motsetning til annan undervisning?

-Kva er den største skilnaden frå annan type undervisning?

-Kva blir di viktigaste oppgåve når elevane skriv? Kva treng dei deg mest til?

Study 2:

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 was 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?

Study 2:

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 him- or 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 nr. 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 backwards?
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 characterize 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".

Study 3:

Core questions for the interviews

- What have been the most important learning activities for you during teacher education?
- Why do you think so?
- How did you experience to participate in the ICT-supported innovation project?
- Did you experience any of the ICT-supported learning activities as a support for your own productive learning process?
- If so, what kind of activities and why?

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Interaction with the computer?

INGRID HELLEVE

Abstract

In classroom situations computers are often used by more than one child at a time. In spite of this, little research has been reported on the quality of this co-operation. The children in the Norwegian 2nd grade presented here, are producing texts together. This research is connecting a socio-cultural perspective on learning to what Timothy Koschmann calls the 4th paradigm of ICT. It shows how children develop different learning strategies according to the task and the context. Many of the children are developing common knowledge and are aware of the benefits of collaboration. On the other hand it also shows how co-operation under certain conditions can be destructive.

The computer is often blamed for making children less social. Furthermore, for changing them into consumers and passive receivers. In the 2nd grade described in this article the pupils themselves are producers. They use the computer as an artefact for collaborative text-writing. In some situations the students are developing common knowledge through collaboration. Most of the pupils are aware of the fact that collaborative writing gives them rewards they could not possibly have gained if they were alone.

Teachers tend to favour collaborative activities. The question is why pupils should collaborate and how the collaborative activities should be designed by the teacher. Through a combination of the socio-cultural perspective on learning and what Timothy Koschmann calls the forth paradigm within ICT and learning, I want to show how the pupils in 2nd grade developed different learning strategies in order to solve the assignments in front of the computer. What I also want to illustrate is how the computer and the peers in some cases managed to develop new knowledge while, given other conditions, the collaborative process turned out to be destructive.

Background and research question

The fieldwork is conducted in a class who participated in the Norwegian action research project “Text-writing by means of computer”; a four-year’ project initiated by Arne Trageton at Stord/Haugesund University College in Norway.

An important condition for the project was that during the first two years at school the pupils should learn to write by means of computers. 14 schools participated in the project. In the 2nd grade where I did my fieldwork the students were always writing two and two together. The

purpose was that they should collaborate when they were writing common texts. The learning activities were based on different topics, mostly based on work-shops and peer learning.

The economic situation in schools indicates that many pupils have to share the same computer. Little research has been done on the effect of this kind of collaboration. In a socio-cultural perspective on learning, the question of to what extent collaborative activities are productive or not is irrelevant:

Collaboration is in itself neither efficient nor unefficient. Collaboration works under some conditions, and it is the aim of the research to determine the conditions under which collaborative learning is efficient (Dillenbourg, Baker, Nlaye & O'Malley 1995, p. 195).

Collaboration works differently under different conditions. People learn through interaction and collaboration. The important research question is the nature of the actual context when collaborative activities work well. This was the background for this study. The research question was: What kind of learning strategies do the students develop, and what kind of interaction is created between students and between students and the teacher when the computer is the third collaborator?

The class worked with different topics introduced by the teacher during the reflection hour. Afterwards the students worked with the same topic in groups in the work-shop. They made figures that they played with. At the end of the day they wrote common texts about what they had done and experienced. Through fieldwork I joined the class for six months. The conversations the students had by the computer were recorded, transcribed and analysed. Additionally I conducted my interviews with the students and the teacher.

The new paradigm within ICT and learning

The computer is an example of a tool or an artefact developed by human beings as they take part in their social and cultural history. The way the learning technology is used in education reflects the perspective on learning on which it is grounded. In spite of the computer's relatively short history in the class-room Timothy Koschmann (1996) points out that during this period we have experienced four different periods or paradigms. Koschmann connects these periods to the respective perspective on learning that has been most influential and argues that these theories are decisive for how we use/utilise the artefacts; in this case the computers. I will give a brief summary of the four paradigms that correspond to the four perspectives on learning mentioned by Koschmann.

The first is called the CAI-paradigm (Computer Assisted Instruction) and is based on a behavioristic perspective on learning. The computer is supposed to help the student to find the

correct answer. Basic for this perspective on learning is that knowledge is objective and that learning is to acquire this knowledge. The purpose of the computer is to support “drill and practice”. Testing the effect of this appropriation is the evaluation of learning. Information Processing Theory is the next paradigm mentioned by Koschmann. This paradigm is built on constructivism but has many common features with the previous perspective on learning. The pupil learns how to construct knowledge through solving problems given through the computer. The perspective on knowledge is the same as in the CAI-paradigm; knowledge is given and the teacher, or in this case the educational technology, is the authority possessing the knowledge. Knowledge is transmitted to the learner. This perspective is a result of artificial intelligence where the interest is to investigate to what extent it is possible to exchange a good teacher with a computer. The third paradigm Koschmann mentions is called Logo-as- Latin. This paradigm has some similarities with the previous. Learning is to discover, and the child learns through constructing his or her own knowledge through the computer. The pupil is the teacher and the educational technology is the pupil. All these three perspectives on learning are built on traditional methods within psychology where the individual is focused.

The fourth and last paradigm is CSCL (Computer Supported Collaborative Learning). This perspective is built on what I call a socio-cultural perspective on learning. Unlike the three others, this view is based on social science and is concerned with understanding language, culture, and other aspects of the social context. According to Koschmann we have only seen the outlines of this perspective. Based on a collaborative view on learning this perspective argues that collaborative activities and conversation are basic for learning through participants’ sharing and constructing new knowledge. Through collaborative activities the students are able to solve problems that are beyond the limits of what they would possibly have managed on their own. What is important is the process more than the product.

The research questions focus on how learning is reflected through the learners’ language. Other important aspects are to investigate how the social aspects influence the learning process and how the computer is used to support collaboration. Another important aspect is to understand the conversations from the learner’s point of view. Furthermore, to understand how the educational technology fits in, changes or supports the students’ conversation.

Theoretical approach

According to Edwards & Mercer (1987), development of common knowledge is as simple as two people coming to know what only one of them knew before. Through language we share our experiences with others and gain common knowledge. Referring to Rommetveit (1974), Hoel (1994) claims that to develop common knowledge means to join a shared social world. The core of the concept, *temporarily shared world of understanding*, is that the participants have to share something. There has to be a common understanding, an experience or understanding which is basic for the development of further collaboration. Without this shared space of understanding further collaborative development is impossible. What happens when children learn through conversation is that they enter this shared world. This makes the conversation a social meeting in a common space where meaning and common knowledge is developed. The individual's contributions within this room or space becomes a common product.

Recent research regards conversation as a social activity where one or two participants mutually influence each other. This might as well be on the cognitive level as well as emotionally and/or through actions. A conversation is always part of a broader context. It is distinguished through a particular complexity and dynamics (Hoel, 1994, p. 179).

This theoretical understanding is mainly built on the tradition from Vygotsky where one of the core concepts is the zone of proximal development. According to Vygotsky (1978) this zone or room holds the potential for learning. The zone is defined as the distance between what the child is able to do on his own and what she or he can manage through support from others. The space contains seeds for development of learning processes that are not yet accomplished. According to Vygotsky they are more like buds and flowers than fruits. Learning is supported by other people, through artefacts like language, symbols and models in a process that is impossible for a child to manage on its own. While Vygotsky and Bruner (Bruner & Watson, 1983) focused on the individual child and its relation to an adult, the interest has turned to the cognitive dimension of collaboration between peers.

The pupils' perception of collaboration

The background for these pupils is that almost all of them can read and write. The basic competence is there. Through interviews most of the pupils claim that they prefer collaborative to individual writing. They have different arguments for their opinions. The following concepts are selected to illustrate the different reasons they have for preferring

collaborative writing; *support, efficiency, common aims, creativity and confidence*. In the following I will present some of the pupils' own explanations.

"I enjoy collaborative writing because sometimes I wonder how the words are spelt. And then we help each other and that is extremely good" according to Kari. This shows that the students give each other support for different reasons when it is necessary. First, the support they experience from their peer is also connected to the content of the story they are writing. John says: "Yes, because then it is much easier to remember what we have done". He can ask his collaborative peer and through conversation they are able to reconstruct the situation they are going to write a story about. Second, the support is connected to their peer when it comes to spelling. The peer is asked first before the teacher. Silje says: "I always ask Mette first, and if she doesn't know then I ask Randi (the teacher). Morten's experience is that it is more efficient to write collaboratively. He argues: "Because when you work together it goes faster. You help each other and everything goes quicker".

The third category tells us that when the pupils share an experience and an assignment, it is meaningful to collaborate afterwards. "It is nice to write with the one I have worked with because then we can tell what we have done" according to Erling. The pupils in this class share a common experience from the activity they have participated in. The fact that they have a common aim through the text they are supposed to write makes it more meaningful to compose this text together than writing alone. The pupils also experience being more creative and innovative when they are together. Gry says: "You become more imaginative. It is easier to invent... It is like having two imaginations".

It is the collaborative situation in itself that opens for innovation. The last category is called confidence. This seems to be the most important argument from the pupils. Many of them mention that it is important to be allowed to write with a friend they know, in whom they have confidence and trust. A general explanation from the pupils seems to be that it is easier to write collaboratively if they have known each other for a long time. "If for example we have had work-shop, then Sol and I usually write together and that is always successful because we have known each other since we were two, three years old" according to Marit.

A few of the pupils in this class prefer individual work. Their explanations are categorised as *simplification, efficiency* and *silence*. The pupils argue that it is difficult to come to any agreement when they are supposed to collaborate. Consequently it is easier to write alone. Tor says: "Because sometimes I want to write something and then the other pupil disagrees". Or it might be more efficient to write alone like Eli experiences: "Because then I don't have to wait for the other pupil when I am going to write." When you are alone it is easier to concentrate

according to Karianne: “The best with writing alone is that it is quiet”. Another common feature mentioned by the pupils who prefer to write alone is that they think the teacher’s argument for collaborative writing is that she wants to put as many pupils as possible around the computer: “Maybe so that more pupils can be placed around the computer”.

Three different learning strategies

I observed the pupils in the 2nd grade through two different kinds of collaborative writing activities. The first is called *experience story*, and the second *creative story*. In the *experience story* the pupils were asked to give an account and write a report from their collaborative activities in the work-shop. The *creative story* asked the pupils to continue writing a story the teacher had initiated. She suddenly stopped when the story was most exiting and left to the pupils to compose the rest of the story together.

Most of the pupils in second grade reacted positively to the collaborative activity they were supposed to do by means of the computer. The main dividing line went between the peers who were willing to collaborate and those who broke the communication. In my material this was a distinction between what I called *interaction* or *counteraction*. Interaction meant that both pupils met with a positive attitude to each other. They created an open, mutual atmosphere. They offered space to their peer and were mutually accepting each other, as opposed to when the pupils had a negative attitude to collaboration. Apparently they gave in before the process started, the willingness to try was absent.

The approach I found here tells something about collaboration and interaction. The dividing line was decisive for the direction the conversations were going to take. If the pupils for some reason or other had a negative attitude to each other or to collaboration, they chose individual learning strategies. If they had a friendly attitude they developed collaborative strategies to solve the problems. The learning strategies the students developed were reflected through three different ways of talking or conversing; *discussional talk*, *cumulative talk*, and *explorative talk*. Through examples from the transcribed conversations I will describe the three different ways of communicating.

Discussional talk means that the participants take individual and independent decisions. They act as if they are in a competition, and the result is often that one of them takes the leadership over the other or that both of them give in. An example of this is the conversation between Monica and Paul. They were interacting in the group-work when they were playing with the figures they had made. Before they start talking together Monica asks me why she

always has to write together with Paul. I tell her that she has to ask Randi, the teacher, that question.

Transcribed:

P: "Er det greit at eg visker"?
(Is it OK that I rub out?)

M: (Bestemt og irritert): "Ja, og eg skriver"
(Determined and irritated): Yes, and I write.

P: "Ja, og eg visker"
(Yes and I rub out).

M: "Okei"
(Okay)

P: "Eg vet kje ka det er eg s-"
I don't know what I s...

M: "Neei".
(Nooo)

P: "Her er eg. Der er det"
(Here am I. There it is).

M: "Eg spør Randi om hon kan hjelpe oss" (To me): "Where is Randi"?
(I ask Randi if she can help us). (To me): Where is Randi?
Both are silent while they are waiting, looking in another direction.

M: "Randi-" (knocking on the table)
(Randi- (She is knocking on the table).

M: "Randi, kordan får man vekk en sånn dings"?
(Randi, how do you get rid of such a thing?)

R: "Å, ja har du gjort det ferdig"?
(Oh, have you finished?)

M: "Randi, eg vil ha kjeempestore bikstaver. Ikke rør sa eg."
(Randi, I want to have veeeeeeery big letters. I told you: Don't touch!)

The conversation starts with him (P) taking a subordinate position and asking cautiously. Apparently Monica is very annoyed with Paul. He offers to be the one who is going to rub out the letters. But she demonstrates by calling for the teacher Randi. While they are waiting there is no contact between the two. Randi is encouraging them to continue but at last she has to join them and compose the text.

One possible reason for the break-down in spite of the positive collaborative experience they had earlier, might be that the distance between them is too large when it comes to writing competence. In this age group there is a dividing line between those who can write and those who can not. From the example we can see that Monica does not even try to initiate a dialogue about what they are going to write. Very soon she calls for the teacher. This might

mean that she already has experienced that they are unable to continue together without any support from an adult. Tharp & Gallimore (1988) show that children need support when they are going to solve a problem. If the assignment is too difficult the need for support from a grown-up will increase. This view is supported by Hoel (1994) who claims that when the distance between the peers within the zone of proximal development becomes too large the communication will break.

In cumulative and explorative talk the students have a friendly attitude to collaboration. In cumulative talk the initiative from one pupil is followed up by the other. The participants are accumulating or collecting knowledge. The teacher in 2nd grade ensures common experiences for the pupils. The topics she initiated in the reflection hour every morning were going to be continued in the work shop. The pupils played with figures they had made and afterwards they were supposed to re-tell what they had done in the *experience story*. Through this process they acquired a common point of view. This time the topic is the Laplanders who live on the Finnmark plateau. The table is full of reindeer, tents, Laplanders, wolves and birds flying over the mountain plateau. Mari has made a Laplander girl who lies outside the tent in the sun. Based on this experience the two pupils go to the computer to write the story of what they did in the workshop. An excerpt of the conversation is transcribed:

V: "Og vi lagde egg."
(And we made eggs).

M: "Ja."
(Yes)

V/M: "Ooo-" (I kor)
(Ann... (Together)

V: "No kan du skrive litt."
(Now you can write a bit)

V/M: "Laa gg d e egg". (I kor)
(Maadde eg (Together)

M: "Nei, vi må gå tilbake, vi må ha enda en G i egg."
(No, we have to go back. .We must add another g in eggs).

M: "Vi lagde samene sitt hus."
(We made the house of the Laplanders)

V/M: "Viii Illlaaggddeee ssaammmeenneee – samene- siiit – h uu s." (I kor)
(We made the house of the Laplanders).

M: "Ssaammmeennee sitt hus."
(Laplanders house).

V: "Hus."
(House)

Their approach to the assignment is that one of them says a sentence. They agree on the next sentence through one of them announcing it aloud. While they are writing it is impossible to single out the individual voice on the tape. They are spelling and writing together. Simultaneously they repeat the sentence aloud while they are writing. Both of them seem to experience a strong sense of community. One of them makes sure that the other one has the possibility to write. Mari shows an example of correcting word-spelling when she is changing “eggs” to eggs. But this happens without instruction. They are equal when they are collaborating.

One of the arguments the pupils had for collaboration in the interviews was that they shared a *common aim*. This is what it is like in the example above. Mari and Vidar are sharing their good experiences through the creation of a common text. They have a positive common experience that they now are writing about together. This is done by collecting the common knowledge they have from playing together in the workshop. The result of the collaborative writing process looked like this:

VI LEKDE MED
 OG DE VAR GØI.
 VI VAR PÅ MODELER VI LAGDE SAMER OG
 DINOSØVRE OG
 FULER. VI BRUKDE HENDENE.
 OG VI LAGDE EGG
 VI LAGDE SAMENE SIT HUS.
 VI LAG BILEN

WE PLAYED WITH AND THAT WAS FUN WE WERE ON CLAY AND WE MADE Lapplanders AND BIRDS. WE USED OUR HANDS. AND WE MADE EGGS AND WE MADE THE SAMIS' HOUSE WE MADE THE CAR

Explorative talk and respectful disagreement

In explorative talk the peers meet with a friendly attitude, but as opposed to the cumulative, they can disagree and accordingly develop new knowledge. Gry and John disagree on a matter of fact. The teacher has started a thrilling story and suddenly in the middle of the text she stops and the two pupils go to the computer to continue what I have called a *creative story*. Through discussion they come to a common agreement. Many of the preconditions that are present in the experience story are in the creative story as well. Transcribed from the tape-recorder:

J.: "Ka skal vi skrive?"
 (What are we going to write?)

G: "Mons gikk inn i kjøkkenet."
 (Mons went into the kitchen)

G/J.: "moonss jjiikk iinn-" (I kor).
(mons went intoo..)

J.: "Med to n'er."
(With two n's).

G.: "I sjøøø—
(In the sitch...).

J.: "Nei, kjøkken- det skrives kj- kj."
(No, kitchen- is written ki- ki-")

G/J.: "Skjøkkenet, sjøkkenet." (I kor, begge ler)
(the sitchen) (Together). They are both laughing)

G.: "Sjøkkenet, det var rart."
(Sichen, that's funny)

G/J.: "Skjøkkenet, nei kjøkkenet." (I kor)
Sisichen, no kischen (Together)

J.: "Nei, det skrives ikke med s."
(No it is not spelt with s)

G.: "kjø- sånn, er du fornøyd, nå da?" (Begge ler)
(kit- so, are you satisfied now?) (Both are laughing)

Seinare:
(Later)

J.: "No er det din tur til å skrive litt igjen."
(Now it is your turn to write a bit again)

G.: "Og da Birgitta kom inn så var fatet helt tomt. Men vi må ta vekk men" (Forslag)
(And then Birgitta entered and noticed that the plate was completely empty. But we have to remove but?
(Suggestion)

J.: "Nei, vi må ta vekk også."
(No, we must remove also)

G.: "Jammen —"
(Yes but--)

J.: "Ooog sååå vvaarr haann sååå trøøøtt aatt-"
Annd soo hee waaas sooo tiiiiiires thaaat)

G.: "Nei, dette blir teitt."
(No, this is silly)

J.: "Nei."
(No)

G.: "Så trøtt at han sovna på gulvet."
(So tired that he fell asleep on the floor)

J.: "Nei, han sovna på hyllen."
(No, he slept on the shelf)

G.: "Nei, eg syns han sovnet på gulvet for da kom Birgitte inn."
(No, I think he should fall asleep on the floor because then Birgitte entered)

J.: "Nei, han sovnet på hyllen,"
(No, he slept on the shelf)

G.: "Nei, han sovnet på gulvet."
(No, he slept on the floor)

J.: "Nei, han sov oppå en hylle og så falt han ned på gulvet."
(No, he slept on a shelf and then he fell to the floor)

G.: "Ja, han var så tung at hyllen falt ned."
(Yes, he was so heavy that the shelf broke)

J.: "Det hadde vært mye gøyere om han hadde falt-"
(It had been more funny if he fell--)

J.: "Så falt han oppi en suppe sånn at han døde."
(And then he fell into the soup and died)

G.: "Nei, ikke sånn at han døde."
(No, he should not die)

J.: "Jo, en muggen suppe falt han oppi."
(Yes, a mouldy soup he fell into)

G.: "Men han døde ikke."
(But he did not die).

This text shows an example of how the participants respectfully disagree. The question is if Mons is going to fall from the shelf and into the soup or not. The further question is if he is drowning or if he survives. The disagreement is related to the case, not to the personal level as in the *discussional talk*. None of them gives in without arguing for their own understanding of why they should change their minds. It is the best argument that wins when Gry also admits that it would be nice if the cat fell to the floor. On the other hand John has to drop the idea that the cat should drown in the soup. When they write they are spelling simultaneously as is also common in *cumulative talk*.

The example shows that one is helping the other with correct spelling of the word "kjøkken" (kitchen). This is not done through instruction. They are both laughing and having fun with the word "sjøkken". They are equal when they are collaborating. Like in the other conversations the pupils were sitting very close when they were writing. The result from the writing process is presented here:

mons gikk inn på kjøkenet og inn spiskammeret
og tok en bolle som lå på fatet nam sa han og tok en til
okshå var han så trøtt att han sovnett opå en hyle
og HAN VAR SÅ TONG AT hylene KNAK
POF POF SA DET OG SÅ LÅ HAN I EN SUPPE

hade BRA MONS

mons went into the kitchen and into the
pantry and took a muffin from the plate yum
he said and then he took one more and then
he was so tired that he slept on a shelf and
HE WAS SO HEAVY THAT THE shelf
BROKE PUH PUH IT SAID AND THEN
HE was lying in the THE SOUP

goodbye MONS

The *explorative talk* has all the same characteristic features from cumulative talk. Additionally this assignment opens for innovation and exploration. In my opinion this approach to learning exemplifies all the reasons the pupils had in the interview for choosing collaborative writing. They support each other, they have a common aim and they are confident. Additionally this example reveals that the participants use their creativity and imagination. Within the approach to learning that the explorative assignment opens for, there is room for development of new knowledge through respectful disagreement and the possibility of asking critical questions. These are criteria that cannot be assigned the examples I have given from *cumulative talk*.

Inspired by Piaget (1926, 1929), the “Geneva school” is founded on the conflict perspective. The socio-cognitive perspective on learning stresses conflict as a motivational power for learning when equal peers are collaborating. Foreman & Cazden (1985) within the Vygotskian tradition assumed that knowledge development among equal peers might as well happen without any disagreement. In the example above, the two participants disagree on a matter of fact, they challenge each other and are discussing, but the conflict is never threatening in the sense that they leave each other. They are confident.

Perhaps the concept *zone of possibilities* used by Engeström (1998) as an alternative to the zone of proximal development, is just as well suited to illustrate what is going on in the creative story. What he wants to pass on is that the child not only is acquiring knowledge of the existing but also renews the existing. In that connection he points to a child’s ability to renewal through imagination and play. The assignment started by the teacher is open for all kinds of endings. It gave room for new ideas and thoughts from the pupils. The creative story, expressed through explorative talk, opens for innovation supported by creativity and imagination. The difference between the cumulative and explorative talk is just this possibility for innovation through asking questions and arguments, supported by imagination and creativity.

Vygotsky and Bruner stressed the fact that the adult or more competent should make a scaffold for the learner. In order to visualise the distinction Hoel (2001) uses the expressions *high* and *low support*. According to her, the two concepts make the most of two ways of supporting different sides of the pupils' potential for development. High support is the systematic support from a more competent peer. This kind of support can bring the student to the limits of his or her learning potential. Low support is the kind of support the pupil gets from peers within the same zone of development. The high support is considered and systematic. Low support is the current, continual collaboration between the peers of how the story is going to develop, what words they are going to use and how to spell the words.

The challenge for the teacher is to perform assignments the students can solve by giving each other this kind of mutual support. In classrooms where the computer is supposed to be a support for pupils' learning processes the teacher has to face many different challenges. He or she has to deal with different aspects, for example social relations and who is going to work in pairs. Furthermore, how to prepare for learning activities the students can write about later, and how to be aware of the performance of the assignments before the students go to the computers. More than ever the teacher has to be able to foresee the consequences and to know his or her pupils' abilities and qualifications. "When the students go to the computer my job is done" according to the teacher in this 2nd grade.

When students at this stage were supposed to collaborate, an important assumption seemed to be that the students experienced being equal as peers. This sense of equity seemed to be just as important with regard to both subject and social matters. Other important assumptions seemed to be to write about a common experience, to share a common aim for the writing activity and to know that the teacher was an interested and attentive receiver of the texts. The assignment should be performed in a way that made the students share and construct knowledge outside the limits of what they could possibly manage on their own. Furthermore, that the assignments are open for argumentation and critical questions as described and explained within the CSCL-paradigm.

Interaction or counteraction with the computer?

The pupils in the 2nd grade use the computer to produce common texts. This is opposed to what we normally associate with the computer technology's abilities to make children consumers of software. Through the interviews the students argued that it was nice or "funny", as many of them expressed it, to use the computer as a tool for writing. Accordingly,

one effect is that through positive experiences with the computer the students learn to take control of the medium as producers of knowledge, not as consumers. According to Säljö (2000), the new technology makes it perhaps even more important than ever for children to learn how to argue and to ask critical questions. What he also claims is that the new technology makes it important to be able to create and produce texts like these pupils are given the opportunity to.

The computer functions as an artefact for collaborative writing for the peer. An important question is why they should use the computer and not just pencil and paper. First, the computer simplifies the writing process because the children just press the button, not to mention the simplification of getting rid of letters.. With pen and paper this can be a toilsome process for children at this age. Further none of the students were superior to the other because she wrote nicer letters. The product of the writing process was a shared honour for both of them. Even in discussional talk where only one of the participants had written anything the text was always referred to as “our” text. The pupils were proudly showing their product saying: “Look what we have written”. Of course they might have said the same if they had used pencil and paper, but given the reasons I have accounted for above my interpretation was that the sense of common ownership to the product was strengthened.

Still the most important point is the computer’s interactive ability. Säljö (2000) claims that the educational technology’s abilities makes it different from other kinds of artefacts people have used so far. He mentions especially the interactive ability and the ability to communicate. The pupils in this study were collaborating with the computer when they were composing the text. They were like a triangle; the two pupils and the computer. I used the metaphor “helmet of glass” to illustrate this phenomena. When the pupils entered the computer world it was like this helmet of glass was surrounding the area. This phenomenon is supported by other researchers who argue that when pupils collaborate by means of the computer they concentrate longer than with other learning activities, whether their work is meaningful or not (Mercer & Fischer, 1997). The same researchers also claim that the teacher is more absent and the pupils left more on their own when they are working with the computer.

For the students who experience interaction with the computer and their peers, this small world around the computer is a good experience to pass on. The opposite experience, on the other hand, can make the same world a straight-jacket of continuing defeats exemplified through Monica’s statement when she has to write with Paul: “Why do I always have to write with him”? The experiences the pupils make when they meet in interaction is something they

can use later. This means that the character of the meeting within the “helmet of glass” is decisive for the pupils. In a socio-cultural perspective on learning, where the process is even more emphasised than the product, a great responsibility will rest on the teacher’s design for collaboration.

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