Collaborative Writing through iPad Sharing

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Abstract: In this paper, we present the findings from a study on the collaborative use of tablets (iPads) in a third-grade primary classroom in Norway where pupils worked on creating fairy tales. The pupils had been using iPads since the first grade. The pupils worked in groups of five, sharing an iPad. We observed and recorded the whole trajectory of the story development, which lasted a week, using video as well as field notes. In the present paper, we raise the issue of what role the tablet has in collaborative writing activities. We analyse our data from a Computer Supported Collaborative Learning (CSCL) perspective. Our findings indicate that the iPad was used as a kind of 'relay baton' in writing activities and that the mobility of the device contributed to the development of the story. However, it is the teacher's design of the classroom activity that is key to the role the iPad plays in collaborative writing activities.

Introduction

Using mobile technologies for learning purposes is not a new phenomenon and can be traced as far back as the early 2000s. Recent research on the use of tablets has been concerned with whether these technologies elicit new forms of learning and what kind (Jahnke & Kumar, 2014). Tablets, such as iPads, have been found to be easy to use (Henderson & Yeow, 2012; Hutchison, Beschorner, & Schmidt-Crawford, 2012), providing easy access to information (Henderson & Yeow, 2012). Recent studies have also focused on the possible use of tablets as support for collaboration (Falloon, 2015; Falloon & Khoo, 2014; Kucirkova, Messer, Sheehy, & Panadero, 2014).

Hutchison and Beschorner's (2015) study of iPads in a fourth-grade classroom indicates that there are several features of the iPad that support literacy instruction. Their findings suggest that integrating iPads supported spontaneous collaboration as well as student interest in and attention to the tasks at hand. Along the same lines, Kucirkova et al.'s (2014) study indicates higher engagement among pupils when using the iPad in story-telling activities. Falloon's (2015) three-year study of primary school students suggests that the iPad helped students collaborate, especially when combined with cloud-based apps. Furthermore, the study suggests that the iPad as a tool might have the potential to blur the lines between formal and informal learning environments. From an exploratory talk perspective (Edwards & Mercer, 1987), Falloon and Khoo (2014) found that when the students used iPads for collaboration, they observed high levels of on-task talk. Furthermore, they describe the potential the iPad has as a shared learning device but note that the teacher's role is crucial in helping pupils structure their communication.

These studies have brought important insight into understanding the potential that tablets bring to classrooms and learning environments as well as the importance of the teacher's role. However, the specific role that the iPad, as a tool, plays has, to a certain extent been downplayed. The focus of this study is to gain insight into the role that the iPad plays in supporting collaborative writing activities. To understand this, we have taken a Computer Supported Collaborative Learning (CSCL) perspective (Arnseth & Ludvigsen, 2006; Stahl, Koschmann, & Suthers, 2014). In this paper we present, discuss and analyse findings from a study on the collaborative use of tablets (iPads) for writing activities in a third-grade primary classroom in Norway. Our study followed the teachers and the pupils at 'Fields Primary School' in Oslo, Norway, for a three-year period (Engen, Giæver, & Mifsud, 2014b, 2014c). The pupils in this study had been using tablets since the first grade and were accustomed to using tablets to support their learning activities. In the study presented in this paper, pupils worked on a collaborative fairy-tale writing project using 'Book Creator' – an app for creating composite texts – in their Norwegian Language lessons.

This paper is organised in the following manner. We first present the theoretical significance of applying a CSCL perspective for understanding the role that the iPad plays in supporting collaborative writing activities, placing this within a broad sociocultural approach. We then present the case and the methods used for data collection. We then conclude by discussing our findings.

The CSCL perspective

Studies within CSCL include perspectives from different learning paradigms. CSCL can be viewed as an umbrella term for various educational approaches involving joint intellectual efforts by students where these activities are supported by and with computers. It is based on the underlying idea that learning is social, where students talk among themselves, and it is through talk and interaction that learning takes place (Dillenbourg, 1999; Gerlach, 1994; Golub et al., 1988; Laal & Laal, 2012). In short, CSCL is a field concerned with collaborative learning and how the collaboration process might be supported by computers. From this perspective, the technology becomes a mediating artefact in line with language as a mediating artefact in conventional teaching, where the interaction between students as well as between students and technology becomes a key concern. CSCL 'locates learning in meaning negotiation carried out in the social world rather than in the individuals' heads' (Stahl et al., 2014, p. 12). CSCL focuses on supporting the process of learning rather than the outcome (Arnseth & Ludvigsen, 2006). Stahl, Koschmann and Suthers (2014) emphasise five basic activities associated with CSCL: students *sharing information* (in broad terms); a considerable degree of *interaction* among a group of learners; *negotiation* with peers, where they present and defend their ideas and exchange diverse beliefs; and the process of negotiation leading to the establishment of *joint meaning making* about theoretical concepts or the *development of common artefacts,* like writing a paper together.

Our study on collaborative learning with the iPad is informed by CSCL (Arnseth & Ludvigsen, 2006; Stahl et al., 2014) and to a certain extent by what has come to be termed mCSCL (Hsu & Ching, 2013; Yanjie, 2014; Zurita & Nussbaum, 2004). The term mCSCL – *mobile*CSCL – implies using digital mobile devices in collaborative learning environments. The field of CSCL includes contributions from different pedagogical paradigms. As our aim is to investigate the role that the iPad plays in supporting collaborative writing activities, our analysis is framed within the sociocultural understanding of learning, where understanding the mediating role of tools is necessary to understand learning (Vygotski, 1978). Mediation refers to the relationship between humans and actions. Wertsch (1998) argues that all actions are mediated, emphasising that one can say, 'I and the cultural tool I employed did it' (p. 29) rather than 'I did it'. This highlights the crucial role that the tool plays in understanding actions. From this perspective, tools are viewed as integral to understanding mediated action. From a CSCL perspective, this implies studying the interaction and collaboration between pupils as well as the actions mediated by the tool.

In applying a sociocultural perspective, the discussion of what kind of tool the tablet is must be taken up. The tablet is, in a sociocultural context, a mediating artefact not unlike other tools we interact with in everyday activities. Both concrete tools – such as pencils, paper and computer screens – and abstract tools – like symbols, signs and mental processes (Stahl, 2004; Wertsch, 1998). CSCL tools typically support both characteristics in the same device. The tablet in itself includes many features that serve as prerequisites for the apps. For instance, most tablets are equipped with both a front-facing and a rear-facing camera with picture and video recording possibilities as well as hardware for audio recordings. These are functions that different apps are based on and utilise, including Book Creator, the app that we observed in use. For the purposes of this paper, we do not make an analytical distinction between the tablet and the app, as they are integral to each other and contain support for both concrete and abstract tools.

Research design

The pupils followed in this study had been using tablets since the first grade, thus they were accustomed to using tablets to support their learning activities. During the first two years of observation we found that the teachers mainly used the tablets for drill purposes or as interactive reading support for the pupils (Engen et al., 2014b) and less often as a tool for pupils to process and produce content.

The aim in initiating this case study was to observe and experience a learning situation where pupils used technology to produce content. The pupils had previously used apps for producing content maps and presentations, but the use was quite limited. We suggested using the app Book Creator for creating composite texts for the teacher. The teacher designed a pupil-centred collaborative activity using Book Creator for the creation of multi-modal fairy tales. The class was divided into four groups of five to six pupils sharing one tablet. The school did not have a one-to-one scheme for students and tablets, but there were several tablets available for use. As researchers, we were present during the five days where the pupils worked on the project as well as one day the following week when the pupils presented their fairy tales for each other and gave each other feedback on the stories.

Data were collected by means of observation supplemented by picture taking and video recording by each of the three researchers. Observations were supplemented by *in situ* interviews with pupils to gain an understanding of the pupils' perspectives of the different activities. To secure the validity of our interpretations, we met at the end of each observational session to compare and discuss our field notes and video clips from different situations, leading to a pre-

analysis of situations. Our discussions and interpretations were analytically framed within CSCL categories, such as '*information sharing*', '*interaction'*, '*negotiation'*, '*joint meaning construction'* and '*development of a common artefact*'. Our approach to the activity taking place in the classroom can be understood in line with the ethnomethological tradition of CSCL (Stahl et al., 2014), which was deemed suitable for a descriptive case analysis. A characteristic of this inductive grounded approach is to discover patterns in the data rather than deductively executing theoretical categories on the data.

Our study followed pupils in one classroom setting over a limited period of time. The findings that we discuss in the next section pertain, therefore, to this particular case study. However, the case-study reported here is part of a larger research project where the use of tablets was studied over a three-year period, following the teachers and the pupils at Fields Primary School in Oslo, Norway, starting when the school acquired tablets in 2011 (Engen, Giæver, & Mifsud, 2014a; Engen et al., 2014c). We, as researchers, were familiar with the context and the pupils. The pupils were also used to our presence in the classroom.

The data presented in this paper derive from one of the four groups of pupils. In observing the pupils, we took a strategic decision, and each researcher followed one group of pupils to be able to follow the trajectory of the book-creation collaboration, the process of joint meaning making and the development of a common artefact among a group of learners. The video recordings were transcribed. The pupils' interactions were transcribed using no particular transcription conventions but close to what can be described as 'normal' speech conventions. The activities, however, were described using software for qualitative analysis (CAQDAS), which was then used to code the transcriptions, taking our point of departure from the pupils' activities, initially giving them descriptive names, and eventually grouping them into categories drawing on CSCL. Excerpts from these categories were then selected on a basis of similarity across the three groups that were followed. The excerpts chosen for further analysis were then translated into English by the authors. Pupils' names were changed to protect the pupils' identities.

Collaborative learning with the iPad

Framework for understanding collaboration and sharing

An important part of the pupils' effort in initiating knowledge building is their motivation toward and understanding of the task given as well as the context they are situated in. The teacher set the frames for the task and the activity by ensuring both individual and group contributions as well as the pupils' understanding of the affordance of the artefacts they were instructed to use (the iPad, the wooden-spoon character, paper, pencils, scissors). The pupils' engagement in the collaborative knowledge building was, to a certain extent, created by the conditions set by the teacher and the artefacts they were instructed to use.

The learning design of the fairy-tale project was organised as a week-long activity where the pupils worked on the project across subjects, thus the pupils did not follow their regular schedule but instead worked solely on the creation of the fairy tales. The teacher's take was that this project was cross-curricular with a special emphasis on Norwegian language learning. The pupils were encouraged to use the school yard and the school's surroundings during the project. They were also given scissors, paper, crayons and glue in case they wanted to create backgrounds or props to add to the fairy tale. The pupils worked freely and independently throughout the week, deciding themselves when to put the effort in and allocating time for creating props, developing the story, getting guidance from the teacher and creating the multimodal text using the tablet.

During the week prior to our observation, the pupils prepared for the project by creating characters that usually appear in fairy tales using wooden spoons in their creative arts lessons. The pupils were specifically asked to focus on their characters' characteristics, such as 'evil witch', 'mean dragon' or 'good prince'. The pupils had also read fairy tales from different parts of the world and discussed the general traits that one could find in the fairy tale genre.

The wooden-spoon characters steered the group set-up (a group could not have two princesses, for example). The teacher designed a learning activity that was highly collaborative but ensured through the task given that each pupil had to contribute. Everyone's wooden-spoon character was to appear in the story, and the pupils were asked to write a minimum of one page each and record themselves reading it. This turned out to be a clever design, including each pupil's participation in the activity as well as developing the story as a group activity.

When our data collection started, the teacher gave a brief recap of the fairy tale genre and its characteristics, focusing on terms like 'once upon a time' and 'they lived happily ever after' as well as what kind of characters usually appear within the fairy tale genre, such as good and evil characters. The pupils started the project with an overall planning

session, taking notes in a form that provided writing frames for elements including the beginning, the ending and the idea of the story. The intention was to help the pupils start thinking about and developing the story. It appeared that other factors affected the development of the story even more, such as spontaneous roleplay using the characters, new artefacts that the pupils made and the pupils' imagination inspired by the environment. The pupils skilfully handled the learning design, which was a mix of openness in terms of the schedule and the use of the school's surroundings and tight instructions. The pupils collaborated and worked toward a common goal for the whole week, alternating between individual and group-oriented contributions.

The pupils' previous experiences with the iPad in school can be described as individual use (mobile devices, such as the iPad, are primarily designed as personal devices). Sharing one iPad in a group of five to six pupils could have proved challenging. Our observations indicated the opposite – that sharing one iPad appeared to support rather than hinder group dynamics and the interaction among the groups of pupils. The fact that the school did not have iPads on a one-to-one basis appeared to be an advantage in this case, as none of the pupils could claim a stronger entitlement to the tablet. In designing the classroom activity around sharing an iPad for the production of a multimodal book, the teacher's design of the activity was key in regard to the role that the iPad played in this collaborative writing activity. As such, one can say that at the outset the collaboration was forced in that the pupils were given one iPad per group. As the pupils were accustomed to using iPads from the first grade and the iPad did not receive any more attention than the other artefacts – such as like the pupils' wooden-spoon characters, drawings, the form for developing the plot, and so on – and can be described as well-integrated in the classroom.

In the teacher's introduction of the app, her main focus was on the potential to write text, add images and record sound. Other possibilities, such as video, were not mentioned by the teacher. She went around to each group explaining the characteristics of a traditional book, such as a front page, text and illustrations combined with a brief introduction to the iPad application 'Book Creator'. When introducing the app, all pupils had one iPad each, so that everyone could try out the functionality of the app. The brief introduction was sufficient for the pupils to start their work.

The iPad and the Book Creator app bring together a number of tools, such as a digital camera, microphone, and so on, and simplify the use of formats. This made the process of creating a multimodal text less complex technically. The tablet can be described as an unobtrusive tool that mediates actions that integrate seamlessly and brings together several modalities. Through the pupils' collaboration, they discovered new features and possibilities of the app.

As said, the teacher gave a short overview of the app to the pupils, but she did not go into specific details, such as the inclusion of videos. The pupils mastered the app quickly and made 'full use' of all the possibilities that the app offered. The pupils started to take photos of drawings and inserting them into their books relatively quickly.

On the second day some of the pupils discovered several features of the app that could be used to enrich the fairy tale, creating a more advanced multimodal text. For example, in the school yard one of the pupils in one of the groups discovered the possibility of embedding a video recording in their book (see Figure 1).

Figure 1 Pupils discovering video recording possibilities with the iPad.

Here we see that while two of the pupils manipulate the puppets another films the setting. After a quick discussion of division of labour, the pupils organised a role-play for their characters, where all the pupils were actively engaged. While some of the pupils were responsible for dramatisation, others were responsible for recording the scenes on video.

(Day 3)
[00:12:49.608] Girl 1: Shall we do it now?
[00:12:50.840] Girl 4: Who are you?
[00:12:50.840] Boy 2: I'm a knight
[00:12:54.867] Boy 1: And you come….
[00:12:54.623] Boy 2: Can I say I saw everything in the back (unclear) (Boy 2 is sitting behind the tree)
[00:12:55.840] Girl 1: No
[00:12:57.670] Girl 2: No
[00:13:00.840] Boy 1: Okay, we have to find something new
[00:13:00.840] Boy 2: But I. Andrew, we have not taken any pictures of the wizard
[00:13:03.225] Girl 2: We're gonna do that
[00:13:05.840] Girl 4: Yes, We're gonna do that
[00:13:05.917] Boy 2: Yes but when?
(Boy 1 and Girl 3 start to play puppet theatre under the tree)
[00:13:10.800] Girl 3: Na na na (holds the puppet)
[00:13:12.923] Boy 1: Hello Red Riding Hood. Why are you here? This is my place. I don't want to kill you, but I will kill you. I, did you hear me?
[00:13:24.050] Girl 3: Yes
[00:13:24.050] Boy 1: You are finished
(Girl 3 and Boy 1 continue the puppet theatre while the others are looking at the recording)
[00:13:52.695] Boy 2: Let's go back to the classroom
[00:13:54.050] Girl 2: Yes
[00:13:54.050] Girl 1: We have to put the video….

Then the iPad was brought back to the classroom, and the video was inserted into the pupils' book and became a part of the fairy tale. Some of the other pupils came to watch the group editing the video, but not all the pupils agreed that videos enriched the book, and one girl in particular was adamant that 'videos don't belong in books' (Synne). The use of a tablet in creating a composite text challenged some pupils' understanding of the book as a genre, for example adding not only images and text but also video and audio.

Nevertheless, without the iPad (as a video recorder) the role play had remained in the school yard as something that was fun that took place there and then. However due to the iPad, this role play was included as part of the broader narrative. From this example, it is not unreasonable to claim that the iPad added a new dimension to the learning scenario, one which would not have been possible without the possibility that the iPad offers. Another dimension the iPad brought into this context was serving as a bridge between the children's play and the story itself. What is interesting is that although we observed the pupils in different settings, such as around the different corridors inside the school and outside in the school yard, it is impossible to pinpoint when they actually were focused on developing the story or when the activity turned into being just children's play. From the example above, with the wooden-spoon characters, it is therefore impossible to say how much of the activity was consciously intended for the fairy tale and how much the pupils perceived it as just play.

The pupils were encouraged to use the iPad outside the classroom, thus the pupils' workspace no longer solely encompassed the classroom but expanded to the entire school premises. The pupils took the iPad, their story and their characters outside to the schoolyard. They used the iPad to take photos of their wooden-spoon characters placed in the grass, leaning against a tree or placed on a rock and thereby made scenes that were used to shape the plot and enrich the story (Figure 2).

Figure 2 Pupils used the surroundings to help create their story and incorporated them into a multimodal fairy tale.

This was exemplified during one of the observation sessions where the pupils made use of a large tree root and transformed it into a cave where the 'wicked witch' held the princess captive for 'a long time'. We observed that the stories developed and changed direction in accordance with the inspiration provided by the surroundings.

With the possibility that the tablet gives for mobility, it mediates an action that leads to the use of the surroundings being included in the fairy tale, thus enriching the tale. Group-based collaborative project work where pupils' creativity is challenged in the process of developing a multimodal text within an expanded learning context that also includes the schoolyard does not represent something new. However, in the particular case that we describe, an enriching dimension emerged: the possibility to make a direct link between the pupils' texts and drawings in Book Creator and the photos and videos. This enabled the pupils to capture the scene and include the picture taken within their story instantly, which led to an immediacy of action – the tool mediated immediacy. This suggests that the mobility of the iPad contributed to the development of the story. Furthermore, the mobility enriched the creation of a multimodal text as a seamless interplay between the pupils, the tool, the different artefacts and the school surroundings.

We observed the pupils sharing the iPad by taking turns in taking charge of the writing process. In this way, we saw the tablet functioning as a 'relay baton' that showed who the pupil in charge was at all times. Thus, having the tablet in hand was a visible sign of contribution. Moreover, this made it more difficult for the pupils to hide behind a more skilled and outspoken classmate. The collaboration on creating a digital book and the idea that each pupil had their own character constituted a basis for the division of labour as well as individual and collective contributions and ownership.

Furthermore, the pupils tended to place the iPad flat on the desk, much in the same way that they would have done working with papers or with a copybook. The iPad placed flat on the table invites collaborative activities, because a flat screen gives better opportunities for everyone to see the product at all times and to contribute through discussion and actions, such as moving items by touching the screen compared to collaboration around an upright screen where one pupil is controlling the keyboard.

When it comes to the role of the iPad, we see from our data that the iPad was important for supporting group processes and dynamics. For the social organisation of the group, it acted as a regulator for action, encouraging collaboration, and the division of labour as well as collaborative and individual efforts. In a broader sense our findings clearly show that the iPad functioned as a scaffold for the activities as a whole. Furthermore, as a tool the tablet appeared to fit well into the expanded classroom environment.

Negotiation and joint meaning construction

The activity during the week-long project was highly collaborative, and the pupils worked on a number of levels – not only in relation to technical aspects, such as how to use the iPad or the application Book Creator, producing text and taking pictures, but also socially in relation to steering the group process by being able to negotiate and accept fellow pupils' opinions and behaviour. When looking into our data, we see that the dialog between pupils is, to a very great extent, about negotiation, including negotiations about the props and where to place them both physically and in the Book Creator app as pictures and negotiations about background colours, the book's cover page, fonts and general

layout and so on. In addition, they negotiated about the grammar, spelling, sentence construction and how the story should develop. The social aspect of collaboration was also subject to negotiation.

Within a collaborative learning environment, the typical synergy of collaboration is negotiations from different perspectives. Individual expressions are open to many different interpretations. In this particular context, one pupil's response is one of many possible interpretations of another pupil's utterance through which s/he seeks to establish its meaning in the discussion. In this communication process, however, joint meaning is affected more by the degree of group interaction rather than individual utterances. Negotiations among a group of pupils, in their effort to establish shared meaning, are therefore more than just individual expressions of meaning but are also ongoing utterances specific to the situation and the context in which the interaction takes place. Thus, a step-by-step common understanding of the situation was established, and the pupils could begin to construct joint meaning of the process and their goal.

One of the first things they did was to establish a common understanding of the layout of the 'book', such as what kind of fonts to use, how to organise the pages and where to place illustrations in accordance with text.

Figure 3 Two pupils move different elements in the (multimodal) book around to make them fit with and around the text.

All pupils in the group actively participated in the discussions on the organisation of the pages and layout of the book. While the tablet was the main tool for executing the action, the tablet's role was not in the fore but rather the subject of the activity. The ease of moving objects around on the screen supported the pupils in trying out different layouts and communicating about them.

Negotiations around spelling, grammar, sentence construction and story development were to a large degree intertwined. In constructing their story, the pupils often gathered around the iPad, discussing and helping each other with spelling and sentence construction as well as grammar rules.

(Day 3)
[00:25:05.487] Girl 2: Red Riding Hood told the king that the queen is evil (reads from the iPad).
[00:25:08.113] Girl 1: (starts writing on the iPad) But the king said that, said no –
[00:25:12.995] Boy 2: No, she is the most beautiful in the country. Hehe. (takes the iPad) no she –
[00:25:21.593] Girl 2: She said no? (pointing at the iPad) But the king said no and shouted at the guards.
[00:25:29.553] Girl 1: But the king said go out.
[00:25:33.502] Boy 2: Get out, yes –
[00:25:34.852] Girl 1: No, not true –
[00:25:38.753] Girl 3: It's one at a time to go –
[00:25:37.095] Boy 2: Get out, but get out –
[00:25:39.143] Girl 1: Get out or I will call on guards.
[00:25:41.368] Boy 2: Yes.
[00:25:44.293] Girl 2: Get out or I will call on guards.
[00:25:44.293] Boy 2: Where is the U?
(Girl 1 points at the letter U on the keyboard).
[00:25:51.917] Girl 3: Håkon, may I?
[00:25:53.273] Girl 1: Two Ls.

The extract above, is a typical example of how negotiations were carried out on several levels in the classroom. The first 12 lines show how the pupils collaborate in developing the story. They bring in ideas for the story, trying to convince the one who is writing. By repeating each other's utterances, they strengthen their arguments. After line 12 there is a break when Boy 2 is trying to find the letter U on the keyboard. The focus changes from developing the story to finding the right letter on the keyboard and correcting spelling. Girl 1 is silently helping him before she orally corrects him on spelling in regard to the use of double consonants (knowledge and an understanding of the use of double consonants is important in Norwegian language learning). In addition, the first four lines show how the pupils' activities are gathered around the iPad – one pupil is reading, one is writing, one takes the iPad to have the control and one is pointing at the screen.

There were several incidents in which the use of iPads contributed to increasing the pupils' awareness of spelling and grammar rules. During our observation, we noticed that the pupils were very careful about not making any spelling or grammar errors when they wrote their fairy tale. We observed the pupils helping to make their peers aware of spelling and grammar errors and revising their work, for example by discussing the use of 'to' and 'and', which in Norwegian are homonyms (the sound of '/o:/').

The next extract, from day 3, illustrates how the collaboration and negotiation around how to develop their story makes the pupils aware of the importance of using correct grammar in the context of the fairy tale genre.

(Day 3)
[00:23:03.708] Girl 3: I have an idea how we should do it
[00:23:07.070] Boy 2: (reads from the iPad) Is to the Queen
[00:23:14.828] Girl 2: No 'was' (points at the iPad)
[00:23:16.277] Girl 1: And is. Not like that, 'was' because it 'was'
[00:23:21.603] Girl 2: I mean
[00:23:25.485] Boy 2: (reads while he writes) E, V, I, L. Evil.
[00:23:29.447] Girl 2: The Queen is evil (points at the iPad)
[00:23:33.448] Girl 1: No, it's because the Queen was evil
[00:23:38.993] Girl 3: He has already written that
[00:23:41.603] Boy 2: I'm the King
[00:23:42.818] Girl 1: Have you written
[00:23:44.723] Boy 2: King that the queen was evil
[00:23:51.270] Girl 3: The king said
[00:23:55.138] Boy 2: But do you know what the king said?
[00:23:56.680] Girl 3: No, she does not. Or? No don't write that – I don't know exactly what to write, but the king - then you must say: The King said
[00:24:03.545] Boy 2: The King (writes on the iPad)
[00:24:08.545] Boy 1: Karen move your head a bit (all the pupils are standing together around the boy with the iPad to see the result)

From extract above we see that there is a discussion about the correct verb tense. Boy 2 reads 'is to the Queen'. Both Girl 2 and Girl 1 think it is a mistake and want him to write 'was' instead. The negotiation that takes place here is implicit to collaborative knowledge construction about the fairy tale as a genre where the story always refers to the past. The process of collaborative knowledge building is here made more visible through a breakdown of the group understanding of the importance of using the correct verb tense in developing their story. Through their negotiations about story development, spelling and grammar rules, the pupils gradually build a shared understanding of the fairy tale genre and the artefact they are about to develop. In other words, it is a process through which a group of learners constructs meaning and individual pupils develop an understanding.

There were several intensive discussions and negotiations among the pupils, particularly during the first days of the project, about what kind of happenings belong in a fairy tale and what do not as well as how fairy tales start and end. A suggestion from one pupil often resulted in comments from the others that led to a discussion among the pupils about the characteristics of a fairy tale. One pupil, for example, insisted and argued that not all fairy tales end with 'happily ever after', whereby to prove his point he looked up a specific fairy tale. Similar discussions were observed in all the groups, indicating an ongoing practice of developing the pupils' subject-conversations and negotiation skills in general as well as practising talking about genre. The development of pupils' skills in conversation and negotiations is embedded in several competence aims for this age group in the national curriculum (The Ministry of Education and

Research, 2006). For example, the curriculum (2006) specifies that by the fourth grade pupils should be able to 'follow up on input from others in disciplinary conversations and ask clarifying and probing questions'.

It is also important to add that learning to collaborate implicitly is an essential aspect when designing learning processes for these young pupils. For example, issues around turn taking was a part of their discourse.

> **(Day 2)**
> [00:38:25.608] Girl 1: Oh yes, but I have an idea. Please listen. You have to raise your hands
> [00:38:30.608] Girl 2: No, we don't have to do that
> [00:38:30.608] Girl 1: Yes
> [00:38:30.608] Girl 2: Karen... (a bit resigned)
> [00:38:30.608] Girl 1: But one thing, one thing. I have a suggestion
> [00:38:35.608] Girl 3: Ingrid! Now it someone else
> [00:38:35.608] Girl 1: I have a suggestion
> [00:38:35.608] Girl 3: Yes, and what's that?
> [00:38:40.608] Girl 1: Ehm, to read it. I just want to read it: 'Red Riding Hood and the evil witch'. Ingrid – eh, yes. yes
> [00:38:50.608] Boy 2: Ingrid
> [00:38:50.608] Girl 1: No. It's a picture of the classroom
> [00:39:00.608] Boy 2: Ingrid. Was that it?
> [00:39:05.608] Girl 2: Let's listen to it Karen
> [00:39:10.608] Girl 3: Once upon a time there was a kingdom no one had seen. It was green and nice. There was a lot of gold and it was very big. Behind there was a wood that was nearby, and in that wood, it was bright and nice. But when you walked a bit, you met a dark scary wood that was.

As seen from the extract above, the pupils are having a discussion about turn taking. Girl 1 (first line) is making an argument that everyone should raise their hands if they want to say something. Learning turn taking via raising hands is obviously one of the first things children are taught in kindergarten and schools and is a fundamental part of the socialisation process. Neither Girl 2 nor Girl 3 thinks the context requires rules for raising hands, and they both disagree. On a more general level, the extract from their conversation is an illustration of (young) pupils learning how to collaborate.

Developing a common artefact – The multimodal fairy tale

During the project, while the book gradually became more developed, the discourse between the pupils concurrently changed. In the beginning the focus was on coming to an agreement around the plot, seeking joint agreement on what belongs in a 'book', layout and the use of fonts and so on. Thereafter, the discussions and negotiations gradually became more targeted at sentence construction and story development.

While the pupils took the writing frames defined in the teacher's learning design as their point of departure for the story, we observed that the plot developed according to inspiration from the contexts in and around the classroom. We earlier mentioned how a tree root was used as a cave; another example is where a hat that was too big for the wooden-spoon character became the character's home. In this way, the props contributed to the development of the story.

At the end of the week, the pupils' discussions tended toward discussions on whether they had fulfilled the task, such as having enough pages, text, drawings and images and whether or not they should have a cover page. While in the beginning there seemed to be more disagreement or individual opinions, there was more joint agreement when the project was about to come to an end. The last task that remained before they could finish their story was to use the inbuilt voice-recording functionality in the app to read aloud their 'own' page of text, which had previously been produced. During this activity the pupils discovered their own as well as others' spelling and grammar errors through reading their text and listening to their own voice recording afterwards. The process could be characterised as being repetitive in the sense that the pupils went back and forth between reading their own text and fixing errors based on feedback from the voice recordings and fellow pupils. There was joint agreement among the pupils regarding not having spelling and grammar mistakes in their book because they wanted a perfect result to present to the rest of the class.

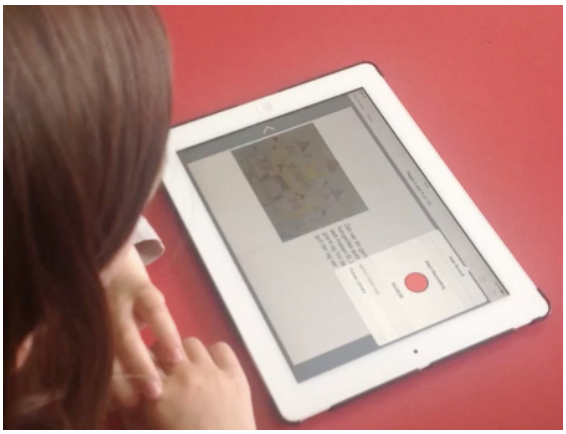

Figure 4 Pupil reading and recording text.

Figure 5 Result in Book Creator.

For example, pupils made comments such as 'I read through the whole book when we were done looking for spelling mistakes'. In this context, the iPad served to establish a learning situation where it was more important for the pupils not to have grammar and spelling mistakes. They were obviously proud of their product. The group process, in combination with the feedback from the voice recordings, supported the pupils' discovery and awareness of spelling and grammar. Also in the final phase of the fairy tale project, the iPad acted as a sort of relay baton for interaction within the group as well as provided support for pupils' discovery of spelling and grammatical errors.

The goal of the fairy-tale writing project was to let the pupils develop a knowledge artefact like the multimodal book made with the Book Creator app represented as a fairy tale. Following the process through the week-long activity, their 'book' gradually developed. This highly collaborative learning situation developed a kind of 'book' that took into account more elements than a single pupil would have managed on his/her own. The group process and dynamics not only contributed to each single pupil learning more about the fairy tale genre, sentence construction, grammar and spelling but also to their thinking about a fairy tale from different perspectives as well as learning how to collaborate.

Conclusions

In this paper we have presented and discussed the findings from a five-day observational study where pupils in a third-grade primary classroom used iPads in creating a multimodal fairy tale. To guide our analysis, we asked what role the tablet has in supporting collaborative writing activities. We observed a highly collaborative activity where the pupils worked in groups. To further guide our analysis, we drew on concepts from CSCL. We have particularly focused on the mediating role of tools as a prerequisite for understanding learning, with a specific focus on the iPad.

The activity that took place during this week-long project was highly pupil-centred and a collaborative learning process dynamically oriented to construct a common artefact. In conjunction with earlier observations, there are good reasons to conclude that the artefacts, both the story and the iPad, gave direction to the activity and supported this highly collaborative learning scenario.

On a general level, our findings indicate that the iPad was an unobtrusive tool that was integrated with the other tools in the classroom, such as the wooden-spoon characters, pencils, drawings and books. From a sociocultural perspective, its mobility led to actions that were not confined to the classroom but that could extend to the areas surrounding the school. Consequently, the actions were seamlessly integrated into the multimodal book – an immediacy of action. The convergence of several applications into one (camera, audio, drawing, writing) reduced the complexity in the production of the multimodal fairy tale, enabling the pupils to focus on the given task. From this perspective, the tablet acted as a bridge between what could be understood as the pupils' play and the story itself. On one hand the tablet functioned as a kind of relay baton, supporting individual contributions to the book, regulating the social organisation of the group(s) and ensuring the contribution of individual pupils to the story. On the other hand, the tablet also supported group collaboration, allowing the pupils to lay the screen flat so as to take part in the group decisions.

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