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Write to Read in Two Different Practices: Literacy versus Technology in Focus

Ulla Damber[1]

[1] Department of Language Studies, Umeå University, Umeå, Sweden

Correspondence: Ulla Damber, Department of Language Studies, Umeå University, SE 90187 Umeå, Sweden. Tel: 46-90-786-5138. E-mail: ulla.damber@sprak.umu.se

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Abstract

Literacy acquisition by using computers and computer tablets is rapidly gaining ground in Swedish classrooms. This article explores the hypothesis that computer-writing vitalizes the learning of literacy, in comparison with approaches using books and pencils. The results of two separate studies in two different settings where prewriting and writing were used to enhance literacy development will be described and discussed. The results of a recent study of classrooms where computers were used will be compared with an older study where students used pencils and paper for writing. The results indicated that the nature of the literacy practice was strongly linked to the teacher's conceptions of literacy and learning. The teachers' choices of computers or pencils as tools for writing do, however, not seem to influence the processes of writing in the classrooms. How writing was enacted in the classrooms and the potential to further development of the literacy practices, were linked to teacher knowledge and the teacher's conception of literacy.

Keywords: literacy learning, computer tablets, write to read, prewriting, playwriting, teacher knowledge, elementary school

1. Introduction

The children growing up today are probably more dependent on their literacy abilities than any previous generation. Our daily lives are flooded with information transmitted through different media, both traditional and digital. Without being able to navigate in this flood of information difficulties in everyday lives and activities will be experienced. In the UNESCO World Education Report (1993) a literate person was described as someone who "with understanding both read and write a short simple statement on his or her everyday life" (p. 24). The past 20 years have outdated this definition and the current aims for students' reading and writing abilities are far more demanding, including the competency of digital literacy. The teachers are obliged to provide their pupils with sufficient tools for personal and professional development as readers and writers. The pupils' educational trajectories may rise or fall in line with their literacy skills as large-scale international survey studies give evidence of (OECD, 2011), thus, successful outcomes of the children's first encounters with reading and writing in educational settings are of great importance (Samuelsson et al., 2005).

Pre-writing and writing may support literacy acquisition among both first language (L1) and second language (L2) learners. This paper illustrates how young Swedish children deciphered the alphabetic code and approached literacy through pre-writing and writing, firstly, by traditional scribbling and secondly, by writing on computers. Pre-writing is an approach to literacy that many children favour in their first efforts to get acquainted with the written language, even though formal training employing phonics approaches and a sole focus on reading dominate in most schools (Fast, 2007). For the reader's information, the emergent literacy activities of children trying to write before they have deciphered the alphabetic code, will in the following sections be referred to as scribbling, pretend writing and pre-writing seen as part of the continuum of children's emergent literacy development (Teale & Sulzby, 1986).

Declining reading comprehension levels in international comparative surveys have caused debate in Sweden about how the students' reading levels can be raised (Skolverket, 2007). Some voices in media link the declining reading levels with with an increased student population with Swedish as their second language. Sweden, unlike many countries, remained a fairly mono-cultural society until the middle of the past century. Today, the demographical scenery has changed and every fifth Swede is of foreign origin (SCB, 2011). The classrooms

have transformed into intercultural arenas with a diversity of different languages. As will be described in the following, scribbling and pretend writing has been observed to support development of emergent literacy skills in inter-cultural classrooms.

However, the strong focus on results, evoked by the declining reading levels, has brought about a search for new methods to boost national reading results, including learning to read by writing on computers. Pens and notebooks still have their place in many classrooms, but computers and computer tablets are gradually finding their way into the Swedish classrooms (Skolverket, 2009). Write to read, a method for literacy acquisition through writing on computers (Trageton, 2005), may be described as a growing trend in Swedish schools. According to Trageton (2005), learning to read by writing on computers may stimulate children's reading interest, a not yet thoroughly researched assumption that sparked our interest, as the objective of this study was to explore how teachers may create literacy environments where literacy thrives. The introduction of computers in the classroom is often initiated by principals and civil servants at a municipal level. Even though media attention has been directed towards this type of projects, only a small number of scientific studies have focused literacy learning by use of computers (Rasmusson & Eklund, 2012). It is in this context we chose to conduct the second study of the two studies that will be referred to in the following. In this paper the findings of two separate studies, conducted in two different settings, will be discussed. In both the studied practices there was an emphasis on writing from school year one. In one of the practices the students were learning to read primarily by writing on computers. The findings from this study will be compared with an older study illustrating literacy learning in a learning environment without computers (Damber, 2009, 2011). Both practices may be viewed as attempts to renew teaching literacy in accordance with the changing demands of society.

In the comparison between the practices the focus is on the teacher's role for the children's active participation in the classroom literacy practices. In the second of the two studies, the computer tablet, as the major artefact for literacy acquisition, attracted our interest, as write to read was employed as the method of teaching. Would new technology bring about any changes in the teachers' conception of literacy and have impact on how literacy was acquired?

Our major intention was not to compare results, as such a comparison would need larger samples offering the possibility to control for the effects of socio-economic background factors. Instead we wanted to compare the literacy practices and how the teachers enacted writing and reading activities according to their conceptions of literacy learning. A secondary objective was to explore how the literacy practices met the needs of children who had a less favourable socio-economic background (low-SES background) for acquiring the school codes, with respect to parents' educational levels, or non-Swedish language background. For many students texts with more complex language, with implicit information make comprehension difficult. Every-day context-embedded communication provides cues for understanding. Text work, however, demand context-reduced language which requires that students develop a more complex register. Bernstein (2000) described how ownership of the school codes is linked to social class, as the language use in middle class families display similarities with the more abstract and context-reduced language used in educational settings. According to Cummins (2000) a combination of linguistic development, cognitive development and code knowledge, including academic codes, are main facilitators to ownership of a broad language register. Both Swedish and international studies display the problems both children from low-SES families and second-language learners may encounter in their development towards becoming proficient readers (Fredrickson & Petrides, 2008; Skolverket, 2009; Van der Slik, Driessen & de Bot, 2006). Thus, we paid attention to how the children were provided with the necessary skills and knowledge to meet with demands of the classroom practices.

As will be described further on, the findings indicated several implications for both practitioners and school leaders, concerning implementation of both new technology and vitalization of literacy practices in the classrooms.

1.1 Pretend Writing as a Way to Decipher the Alphabetical Code

Even though reading and writing traditionally have been taught as two different subjects, the view of reading and writing as an intertwined process has trickled into many Swedish school and preschool practices, even though reading still is the dominant activity of literacy acquisition. For young children, drawing, playing and talking are all symbolic activities forming bridges to literacy (Dyson, 1997). Different marks on a paper represent the children's own experiences, feelings and ideas. In other words, the children's explorations of printed matter, often in informal settings, make them detect the resources for communication embedded in the use of script (McLane & McNamee, 1990).

When children start scribbling, often imitating adults' literacy behaviours, communication of the meaning of the words triggers the pupil's wish to write. Even though the pupil might not be able to pronounce the word correctly, the meaning is clear. The child can write his/her conception of the sounds of the words. Thus, the pupil finds evidence for the assumption that print events are communicative and meaningful, even if the spelling goes astray. Learning takes place in a comprendable context (Cummins, 2000). According to Liberg (1990), decoding words is a harder way to decipher the code than scribbling, which supports the growth of phonological awareness without sacrificing opportunities for the exploration of the meaning-making functions of print. In particular, if a second-language learner's interim-language is still developing and the sounds are not yet pronounced correctly, listening comes easier than synthesising letter sounds in the correct way (Erikssen Hagtvet, 1990). Liberg (1990) who studied children's literacy acquisition describes a U-shaped development. Firstly, the child "reads" and "writes" a lot on pretend reading and pretend writing levels. At this stage the child has not yet deciphered the alphabetic code, but imitates the behaviour of older readers and writers. When the students realize that text represents meanings, the stage is set for further explorations of the formal structures of print, as the connection between phonemes and graphemes is not yet well understood (Bialystok, 2007). The child reads and writes what he/she wants, and the content may be very developed. The child who has invented the spelling and the symbols is the only one who can "read" the script, with exception of logotypes, which are perceived as pictures (Ehri, 2005). When the child realizes that the letters need to correspond to certain sounds in a particular order to make sense, the next phase of literacy development is entered. When observing children in this phase, you can hear them sounding out the letters to figure out what letters to write and the child's meta-linguistic cognition is alerted (Ehri, 2005).

In addition, writing processes are recursive, which implies that the writer reads and revises the text. Viewing reading and writing as complementary processes brings about didactic consequences. The idea that students need to learn to read before they start writing is set aside. Instead, genuinely communicative situations are staged. Reading a text, or listening to a text, generates talk around the text, drawing and/or writing, which in turn may lead to more reading. The activities are often experience-based and carried out within the framework of themes, to support the students' language development. Both linguistic features and content is possible for the students to recognise. As a writer, a person may employ similar strategies as when trying to comprehend a text; activates background knowledge, define the purpose of the text, pays more attention the more complex parts of the text and depends on the same narrative structures (Erikssen & Hagtvet, 2004). Thus, reading and writing may create positive synergetic effects, in particular when dialoges and oral activities bridge the gap between the written and spoken words (Tornberg, 2009).

1.2 Earlier Research on Computer Use

Results of research on the effects of technological tools on children's writing are often mixed and somewhat hard to interpret (Peacock & Beard, 1997). Social, curricular, instructional and technological factors are often intertwined in the results, thus, the effects of the technology itself on literacy development are hard to entangle (Salomon, Kosminsky & Asaf, 2003). According to Solomon, Kosminsky and Asaf (2003), there is a need to distinguish between the long-lasting effects of and short-term, more direct effects with technology use. The short-term effects, such as improved spelling or a higher quantity of paragraph revisions, do not seem to transform to writing performed with other technologies, as these changes in performance take place while the student is working with the computer (Reynolds & Bonk, 1996). Salomon, Kosminsky & Asaf (2003) claim that effects of computer use "pertain to more lasting and generalizable changes of writing-related cognitions, strategies, abilities and dispositions that are consequence of writing with, say, a prompting word processor" (p 356). Such changes last also in the absence of the word processor.

As regarding any writing instruction, real world situated, collaborative writing contexts seem to have positive effects on the children's writing, This also applies to computer aided writing where a computer program, instead of peers or the teacher provides cues for writing (Salomon, Kosminsky & Asaf, 2003). Authentic experience-based problem solving and writing for a real audience trigger similar positive development with improvements both in basic skills and in the over-all quality in essay-writing (Andrarde & Perkins, 1998). Practices intended to promote students' knowledge construction seem to have positive effects both for students' writing and reading, as knowledge sharing, critique and argumentation was built in as elements in both writing and reading processes (Hakkarainen, Lipponen & Jaervelae, 2001).

Some negative effects of word processors have also been identified in earlier research. First, the the children's lack of overview of the whole text may render in revisions of mechanical nature limited to the sentence level, such as spelling corrections (Haas, 1996). Such findings seem to correlate with classroom practices with a skills focus, where literacy is seen as a decontextualized activity. In other words, the question how much technology in

itself affects students' literacy learning, as compared with the literacy environment at large where instruction for the task and teacher assistance are the major impact factors on the students' learning (Peacock & Beard, 1997).

1.3 Motivational Factors and Literacy Learning

One aspect of literacy learning that deserves mentioning is the role of interest in reading and writing, as a large amount of effort and motivation is needed to acquire reading comprehension strategies (Guthrie, 2004; Stipek, 2002). One reason that motivation is related to reading comprehension may be that engaged students try to process content information deeply in order to fully comprehend the text. Earlier research supports the claim that reading comprehension levels correspond with reading engagement (Guthrie & Wigfield, 2000). Intrinsic motivational factors seem to play an important role for reading comprehension (Gottfried, 2009). Focus on external motivational factors, such as rewards for reading achievement in terms of reading a certain number of pages in a stipulated time, come short.

1.4 A Framework for Literacy Pedagogy

The Four Resources Model of Freebody and Luke (2003) describe how the functions of different learning activities were viewed in the present study. The model encompasses a wide range of factors intertwined in the learning processes going on in the classrooms. The model provides a dynamic framework of the specifications for literacy pedagogy, curriculum and assessment, without being founded on the idea of one universal method or one scientific theory. Instead, the model may be used to explore adequacies of competing approaches to literacy, so that both social and psychological theories may contribute to the understanding of the literacy practices. As we live in multilingual, intercultural, heterogeneous and diverse societies, a broad and flexible repertoire of practices is required (Freebody and Luke, 2003). According to Freebody and Luke (2003) participants in literacy events need to be able to decode in order to become readers. However, the role of the decoder is not the only reader role that has to be accounted for. The role of the functional text user, the reader who knows how to adapt language and text structure according to the situation, the recipient and the mode of communication also calls for attention. Furthermore, there is the role of the text participant, which deals with "understanding and composing meaningful written, visual and spoken texts in ways that connect texts' meaning systems to people's available meaning systems" (Freebody & Luke, 2003, p. 56). Finally, the role of the text analyser calls for attention, including critical analysis of texts building on an understanding that no texts are neutral, as all texts represent particular views and silence others.

According to Freeebody and Luke these roles develop in parallel, thus, indicating that focus on content and reading/listening comprehension should not be postponed until later school years, when the students are fluent readers. Therefore, we found this framework relevant as a framework to our discussion of teachers' enactment of literacy learning in the preschool class and the first years of formal schooling in two different learning environments, one computer aided and one without computers. In the following, the rationale of our discussion of the two literacy practices will be described, followed by brief descriptions of the two foregoing studies which provided the results around which our discussion evolves.

1.5 Rationale of the Comparative Discussion

The above described framework for literacy pedagogy provided frames of reference for our comparison of two different literacy practices. The objective was to compare and discuss the two literacy practices both in which scribbling and writing were used to enhance children's early literacy development. As slightly different methods were used to collect the empirical material, the framework by Freebody and Luke (2003) seemed relevant to encompass the explorations and discussions of both practices.

In the two studies that will be discussed, both qualitative and quantitative methods were used. We realize that the interpretations we present here are influenced by all the data material that was collected. However, as the teachers' conceptions of literacy was one of our interests, we chose to restrict our presentation in the article to qualitative data from interviews and field notes, in order to present the teachers' own constructions of literacy learning. We attempted to interpret the data reflexively, aware of the fact that there are no simple or undisputable rules and procedures for doing this (Alvesson & Sköldberg, 1994). However, we tried to carry out a dialogue with the subjects of exploration as well as with ourselves to enhance abductive interpretations of the data from the two separate practices (Maranhao, 1991).

Both practices in focus had the ambition of trying new ways for children's literacy learning, one of using traditional tools for writing and reading, such as books and pencils and the other using computer tablets. Our interest of inquiry was as follows:

- How was scribbling and writing employed in the two literacy practices?

- How did scribbling, writing and reading interact to enhance literacy learning?
- Would new technology bring about any changes in the teachers' conception of literacy and have impact on how literacy was acquired?

Below the two studies will be described separately, before the discussion of the comparisons between the two practices will be presented. The two cases are referred to as the City School Classes and the River School Classes. The number of Swedish children attending grade 1 and grade 2 consist of slightly more than 100 000 students in each grade. We are aware of the fact that the results from the studies are far too limited to generalize from to the whole population or to the two populations of the compared schools. However, the studies may be viewed as two separate case studies where genralization of the results to the population was not the prime purpose. We had the ambition to explore literacy development in natural environments in order to find empirical evidence to existing theory (Bell, 1999; Yin, 2003). Furthermore, we find that the coherence between our findings and findings described in the literature offer reasons for further reflection. Below two cases, each consisting of one preschool-class, one grade 1 class and one grade 2 class, will be presented.

2. City School Classes

The empirical data illustrating the first example of literacy learning where students' writing played a significant role were collected in 2007–2008 within realms of a larger research project exploring how teachers can contribute to their pupils' successful literacy acquisition in classes where prerequisites, such as socioeconomic background factors, language background and home literacy environment, do not predict high achievement in reading (for details see Damber, 2009, 2011; Damber, Samuelsson & Taube, 2012). The setting of the targeted classes was a suburban, low social economic status (SES) area in Stockholm characterized by low educational levels and an immigrant population of 89% with origin in Africa, Asia, Europe and South America and school classes where a multitude of different languages were spoken (see Damber, 2009). The school in focus had around 275 300 students (K-5).

2.1 Method

The empirical data for the comparison presented here was collected by in-depth interviews with three teachers and one preschool teacher. The interviews were based on a thematically structured interview-guide, providing questions on personal data, classroom climate including personal relations in the classroom, cooperation, resources in the classroom such as equipment, supply of literature, and how the teachers perceived their assistance to the students to become proficient readers. These teachers were selected to provide data to this comparative discussion as statistical results had pointed out that these teachers' classes were achieving at higher levels than could be expected with regard to socio-economic background and language factors (see Damber, Samuelsson & Taube, 2012). The interviews, lasting from one hour and a half to two hours, inquired about the teachers' work in two classes (school year one to three) and one preschool class. As the statistical data did not illuminate what really happened in these classrooms qualitative data was called for. The number of children in the targeted classes varied from 22 to 24 children with an even distribution between boys and girls. 89 % of the children were L2-learners. All informants are referred to with fictitious names. The interviews were carried out in accordance with the general acquirements for Research Ethics (Vetenskapsrådet, 2010), and recorded and transcribed by the author.

2.2 Findings

2.2.1 Focus on Literacy

Of interest for this comparative study is that the children in these classes followed a "book-flood" approach, where reading primers were substituted for by authentic children's literature (Clay, 1998). The reading of vast amounts of children's literature may be seen as the major characteristic in the targeted classrooms. Each classroom library had between 100–200 books and 10,000–12,000 loaned books of children's literature were registered in the library. "Reading was no longer something you did because it was on the schedule, as reading permeated the whole school", Barbara, one of the teachers explained. This book-flood approach was one of the first of such approaches to literacy learning in Sweden and this initiative emanated from the teachers, as they felt a need for trying new ways of working with the children's literacy learning in their inter-cultural classes. The teachers' first step was to establish close connections with the local librarian. The focus on children's literature was also implemented in the preschool, where the librarian made book presentations to offer popular children's books to the children and presented a summary of the contents. Elements linked to the book-flood approach like scribbling, joint discussions of books, the children's own book presentations, drama, artwork and a strong focus on oral activities characterised the learning environment, together with scribbling and writing form preschool

and onwards.

As the language levels among the children were low in preschool, owing primarily to the high percentages of second-language learners, the teachers felt that a focus on authentic literature was worth trying in order to enhance overall language learning. Inga, the preschool teacher, summed up the activities in preschool: "Playful activities, such as pretend writing, stimulated the children's interest in literacy, but also taught them Swedish. No traditional 'school' at all".

2.2.2 The Role of Scribbling and Writing

All the teachers mentioned scribbling as an important tool for the children in their explorations of the connections between letters and sounds:

> They all got started with scribbling. Everyone found their place, irrespective of their language level. Kids who couldn't write, they drew something from a book, lyrics, what we had seen outside. They got a good grasp of the content. And the language…that was really the heart of the matter. But more than on a superficial level. No *traditional* grammar or spelling, however. (Sanna, teacher)

The quotation above illustrates how the teachers tried to make connections between the children's own experiences, also form an out-of-school environment. The quotation also illustrates how focus on meaning-making was established before all of the children had deciphered the alphabetic code. As the children grew older the pictures were replaced by print and the children wrote book reviews. In grade 2, the children were urged to step inside of one of the characters and take on the first-person perspective. According to the teachers, the texts improved significantly as they then had genuine knowledge about what they were writing about.

2.2.3 From Linguistic Awareness to Process Writing

An overarching intention to make the children familiar with the functions of print was present. In both school and preschool, the teachers wrote down stories on flipcharts, often about a toy the teacher had brought:

> Every child contributed with one sentence and we discussed the verbs and prepositions and such things, as their Swedish wasn't that good in those days [referring to the children's language levels in preschool and grade one]. But we always wrote down what the children said, without changes. In preschool the children always wanted the preschool teacher to read aloud what they had "written" the day before. So she did, following the letters with her finger as she read. The children always started to ask questions about the letters and the letter names. But we never sounded out single sounds. Instead they learnt what a full stop means, how many words there may be in a sentence and so on. /…/ In addition, we often wrote down what we said on the white board, so that they could see that the written words were possible to read. And in the long run most of the kids cracked the code in preschool. /…/ But we never corrected anything. We only encouraged them to keep on writing. "Good!" No negative comments. When their writing wasn't that good, we looked at the work from last week, so that the child could see improvements (Barbara, teacher)

This intention to create an environment with authentic books and real world-related problems and issues to talk, read, and write about characterized school as well, where thematic work had its given place. Process writing was implemented from a very early age. In discussions of language use the point of departure was the functions of i.e. verbs and prepositions as no descriptive grammar was taught. In grade 2, the teachers were quite strict about correct language use, as many of the children's parents were illiterate or did not speak Swedish. The children also got accustomed to continuous revisions of texts, as the recursive character of the writing process was given attention. One eight-year-old boy started crying when he was told to cut down his text in order to improve the text. When his friend explained to him that "this is the way all real authors work", the boy accepted the proposals to revise without complaints. A majority of the children, did according to the teachers, view themselves as authors. The teachers also collaborated with authors who came to the classroom and conducted workshops with the children to teach them the craftsmanship of writing.

To conclude, there was a strong focus on literacy encompassing school-wide practices. Writing and reading were seen as interdependent activities from preschool onwards. Meaning-making was the point of departure for both letter learning and deciphering the code, and scribbling was an important part of this process, providing hands-on opportunities to explore the functions of print in meaningful contexts. The quite pronounced demands on correct linguistic form in the later stages of the children's literacy development helped the children to develop their language skills, but the employment of thematic work embedded the formal aspects into content that was meaningful to the children.

3. River School Classes

The second study was performed in 2011–2012. The objective was to explore and analyse the role of scribbling and writing for classroom life and literacy learning at an all-Swedish K-5 school located in a middle-class/lower middle-class commuter community (around 2,000 inhabitants) 17 kilometres outside one of the larger northern Swedish cities, which is dominated by the forest industry. The school, denoted as River School, had about 325 pupils with an even distribution between boys and girls, ages 6–12 years, including a unit for preschool classes. The targeted classes had between 22 and 25 children in each class.

3.1 Method

The reasons for targeting the River School classes as an object of study was its information technology (IT) strategy aiming at making use of IT as a pedagogic tool. Three teachers responded positively to the principal's call for interested teachers to participate in a project where computer tablets would replace pencils and reading primers as tools for the initial literacy learning. Tablet computers with a touch interface were purchased, so that all the pupils in grades 1 and 2, when divided into pairs, had access to tablets, which were kept in the classrooms with two or three computers. The kindergarten children had access to tablets as well. The teachers started a project where the children in the preschool class and in grade 1 wrote exclusively on computer tablets in order to learn to read (Lövgren, 2009). These three teachers and their classes were selected as they were the ones who had been provided with computer tablets for the students. In grade 2, the children started writing with pens and pencils. The idea was that learning letters by writing them on the tablet would enhance the pupils' phonological awareness in combination with traditional phonics as the children similarly learnt the alphabet and started to decode. According to the teachers and the principal the children turned into skilled readers and writers much faster than classes who were given traditional reading instruction.

The results of classroom observations and interviews will be reported here. Two collaborating researchers visited the classrooms (including the preschool class) four times and observed the classroom activities in the Autumn 2011. Teacher interviews were performed in Spring 2012. One of the researchers focused her observations on the children's interactivity in front of the computers/tablets while the other researcher focused the teacher's talk and actions. Field notes were taken, but no recording devices were used in order not to intervene too much in the regular classroom activities. The three teachers were in-depth interviewed, by use of the same interview-guide as the one employed in the City School Classes, with questions added focusing the use of computer tablets. The data collection was carried out in accordance with the general acquirements for Research Ethics (Vetenskapsrådet, 2010). The interviews were recorded and transcribed by the author. All contributing informants in the following sections were given fictitious names.

The teachers turned down an offer to perform the reading comprehension test employed in the City School Classes. Thus, a simpler reading comprehension test, standardized and normed for grade 2 was used to give an indication of the children's reading levels, even though the literacy practices as such were in focus of this study.

3.2 Findings

3.2.1 Focus on Technology

The reading comprehension test results from grade 2 revealed that both the targeted class performed at levels somewhat below the average results in the population of Swedish children taking the test. The observations showed that reading had been given a subordinated role in the studied practices. During our observations, we saw very little of meaning-making connected to reading and no silent reading sessions exceeded 20 minutes. The teachers read children's books aloud, but never for more than 10 minutes and no activities introduced the reading sessions, nor were any follow-up activities undertaken.

The children were having their morning fruit during the reading sessions, so the sound of chewing competed with the teacher's voice. During Read-Alouds the children were occupied with drawing, tearing little pieces of papers or talking. That the reading session was not a very important activity was signalled also when the teacher in grade 1 read aloud. Also in grade 1, the children were having their fruit during the reading session. No introductions of texts were made, not even when children had been absent when the teacher read the previous chapter of the book. Nor were pauses for children's comments made. The lack of time for communicative activities in connectionto both silent reading and Read Alouds, was partly due to the time spent on connecting cables, helping the children to log in, save, print and so forth, according to the teachers. That the teacher's interactions during lessons primarily were preoccupied with technology-related issues, showed to be a solid pattern both in grade 1 and grade 2.

3.2.2 The Role of Scribbling

Pretend writing activities in preschool were also carried out on computer tablets. According to the preschool teacher, the prewriting activities were always initiated by making drawings,as will be illustrated in the following episode that was observed. The children were drawing wizards, and the drawing activities were accompanied by the children's dialogues about their drawings. After a while, one girl, Maya, declared that she was ready to start writing:

Moa [her friend]: "But we can't write…."

Nevertheless, Maya went looking for her log-in number to the computer. After searching through some folders, she found the plastic card with her username and log-in number. She copied the information from the card onto the computer:

Maya: "Where is it [her file folder]?"

The preschool teacher found the school folder, then the class folder and eventually Maya's folder and opened it. The preschool teacher then rushed to assist a third girl whose computer would not start. Another computer was set up. Meanwhile, Moa, who like Maya showed indications of her beginning literacy development, had started writing:

moaertyyudfghh

Maya then erased the text and continued to write symmetrical rows of letters:

Moa§8§8§8§8§8§8§8§8§8§8

Maya had also written her name and the correct date and read the text out loud, when the preschool teacher arrived to listen to the text: "Once upon a time there was a Moa." The teacher sat down in front of the computer and wrote: "Once upon a time there was a wizard named Moa". The procedure described above illustrates the act of "ghost writing" where an adult transcribes the text of the "author", in this case Maya. The fact that the girls know how to write their names gives evidence of the fact that the students have started to connect sounds with letters, but evidently the girls were still in the logographic phase of writing development (cf. Ehri, 2005).

By then Maya had lost interest in the text and could had forgotten what she had intended to write. The teacher prompted her: "Perhaps what Moa likes?" Maya gave no response and her eyes travelled around the classroom, so the teacher finished the text herself and wrote that Moa liked ice cream as "we need to keep on writing a bit more". Maya did, however, not listen as she had walked away. At several occasions we observed how the children's texts were altered by the teacher to make the stories longer and more elaborate. A general characteristic of these literacy events was that very few of the teacher's comments dealt with the content in the texts. A major part of the interactions focused on the technology, such as what key to press and formal aspects of literacy learning, such as combining sounds with the correct spelling of the sound. When the children sounded out a letter correctly, the teacher marked the known letter with a highlighter, but little interest was directed towards the contents.

3.2.3 Writing and Reading as Individual Skills

In grade 1 letter knowledge and the copying on the tablets of words written by teacher on the white board dominated the literacy activities, with correct spelling as a prime focus, a pattern also discernable in grade 2. During the following episode the children were writing Christmas stories. The teacher approached two pupils in front of one of the computers and read aloud: "Once upon a time there were two children nammed [sic!] Peter and Petra. They lived in a flat in two days it was going to be Christmas eve." "And where is the full stop?" the teacher asked, which made the children reread the text and change the lower case "t" into a capital "T" (They). The teacher asked no other questions about the story. Instead, she got involved with signing work schedules that a row of children showed her. The work schedules, that the children worked with in order to make room for other children to work with the computers, offered six different tasks: drawing patterns, colouring patterns, math exercises, Mystical Letters (cards with tasks such as writing down rhyming words to "cat", or copying the correct answer to the questions like "What is the calf's daddy called? A. Cow, B. Bull C. Lamb"), writing a story and two times for silent reading for 20 minutes. In grade 2 writing by hand was introduced and the children completed rows of hand-written letters in their notebooks.

As in the earlier observations, the teacher primarily spent her time dealing with the computers and tablets. When giving feedback to the pupils' stories, punctuation and spelling were prime focus. The children's interactions in front of the computers were mostly focused either on spelling, how to save or change fonts or similar matters. In grade 2 a majority of the children chose to write individually, instead of in pairs. The pair-work most often was

divided so that the children wrote one sentence or one row each. A period of thematic work with Space, involving reading and writing of factual texts, was mentioned in the interview with the grade 2 teacher as an occasion when discussions of the content also took place in connection with the writing.

In conclusion, we observed a stronger focus on technology than on content matter in these classes. The lack of collaboration and dialouges, when engaging in the writing process, had according to our observations as an effect that much progression of the children's meta-cognitive development did not occur. This pattern applied to both writing and reading activities. Content in both writing and reading events seemed to be of subordinated interest to the children and as well as to the teachers. Both reading and writing were talked about and dealt with as instrumental skills, a view which the work schedules also encouraged. For example, the task of silent reading for 20 minutes emphasised only the quantitative aspect of reading, as no text talk or other follow-up activities were included. The reading task was premiered with the teacher's signature, without any concerns about the quality of the child's understanding. We did, however, observe that the pupils developed an interest in linguistic correctness. The children's book reading was also organised to enhance quantity, as the children were promised a party when they had read 100 books. Only few signs of didactic ambition to embed content in meaningful contexts, as the Space theme mentioned above, were identified.

4. Comparative Discussion of the Two Practices

The analyses of the data from the two studies indicated both similarities and differences between the targeted practices, which will be commented on in the following. Primary interest was taken in how functions of print were observed in the classroom, employing the four reader role model (Freebody & Luke, 2003).

First, school-wide visions were discerned in both samples. A strong focus on reading literature and literacy dominated the City School Classes. Conditions for socializing pupils into readers and the writers were created and the conditions for literacy learning were optimised as reading and writing were implemented as valued activities (Axelsson, 2000; Bialystok, 2007). In River School the focus was on use of technology as such (Peacock & Beard, 1997). Furthermore, the implementation of the computer tablets was time consuming, and according to the teachers, the result was that little time for reading was left. The children showed craftsmanship in their use of the computer tablets, but reading was scarce and dialogues about texts did not occur on a daily basis. The subordinated role of reading and functions of literacy probably helped to sustain the children's rather detached attitudes towards reading fiction.

Second, the purposes for literacy activities were different. In the City Classes, knowledge through encounters with authentic literature created context and point of departure for language learning and practices aimed at formal aspects of written language use. . At River School, the ambition to make the pupils computer literate and the acquisition of the *skill* of writing dominated. Learning activities were only sparsely embedded in wider learning contexts. In the City Classes activities like drama and artwork and were tied to the processing of the contents in children's literature, thus providing a meaningful real world situated context for the literacy events with clearly communicated purposes of the learning activities. At River School a major part of the activities were solitary and context-reduced (cf. Axelsson, 2000; Cummins, 2000; Salomon, Kosminsky & Asaf, 2003). At River School, a culture of "doing" dominated, where the purposes with different tasks were not clearly communicated, thus communicating unspoken quantitative aims where the pupils executed tasks to satisfy the teacher, linking to the third major difference between the practices, namely motivation.

Third, intrinsic motivational factors for reading and writing and the children's own interests formed the driving force in the City School Classes, whereas lots of evidence of external motivational factors, such as signature hunting or rewards after reaching quantitative goals were observed at River School. Reading and writing are activities that are closely linked to identity formation, and numerous studies confirm that internal motivational factors characterise classes with high literacy achievement levels (Eriksen Hagtvet, 2004; Guthrie, 2004).

Fourth, even though scribbling and large amounts of writing characterised both practices, the writing processes had different foci and different didactic tools were employed. In the City Classes, meaning-making was at the heart of the literacy activities. Oral proficiency was central (Bialystok, 2007). Recurring negotiations of meaning characterized reading and writing sessions (Damber, 2009; Droop & Verhoeven, 2003). The large amount of reading brought about learning of less frequent words occurring in print, thus extending the pupils' vocabularies (Chiappe, Siegel, & Wade-Wooley, 2002). Process writing, vocabulary, and critical awareness exemplify domains where dialogues are critical to further development, irrespective of the children's language background. Thus, the *combination* of reading, writing and oral activities enhanced the children's language and literacy development. At River School, however, *writing* was emphasised and very few teachers' prompts concerning meaning-making in reading or writing were observed. Even though the children were writing in pairs in grade 1,

we observed only short and superficial discussions among the children of the contents as the interactions primarily focused on spelling and punctuation. Scribbling, reading and writing were not inter-woven to interact in the same extent as in the City School classes. As only little interplay between reading and writing took place at River School, the synergetic effects of reading and writing in parallel did not occur, which the low reading comprehension results give an indication of (Tornberg, 2009).

Fifth, the formal aspects of language use were given attention in both practices, a necessary element in the development of functional written language. However, content matter and negotiations of meaning were given the *primary* focus in the City Classes. Thus, tuition regarding formal aspects of written language was carried out in a larger context where the children's understanding how function shapes the structure framed the formal aspects of language use (Freebody & Luke, 2003). At River School linguistic correctness appeared to be an aim in itself, disconnected from its function in different types of texts. On several occasions, we observed how the teachers "corrected" both content and form to produce correct language, thus implementing focus on form, at the expense of content. The teachers' habit of altering words without the children's consent, most probably impaired the opportunities for the children's phonological explorations. The City School teachers, in contrast they "always wrote down what the children said".

When comparing the practices with the four reader roles described by Freebody and Luke (2003) the competences of the decoder, the text participant, the text user and the critical reader were all observed and developed in the City Classes, much owing to the teachers' ambitions to engage the children in real world challenges, such as collaborative revisions of both language and contents in texts. At River School we observed how the children developed the resources of the decoder and, to a certain degree the role of the text user with respect to computer use, an opportunity the City Classes did not have.. A rich print environment where the children are scaffolded to develop meta-cognition and different reader roles i.e. by use of writing, trigger what Salomon, Kosminsky and Asaf (2003) refer to as long-lasting, transferrable "effects of" the computer. What we saw at River School was short-term "effects with" the computer, effects which not necessarily transfer to another mode or situation for writing.

5. Conclusion

To conclude, the teachers in the City Classes give many hints about how the teachers at River School could embed learning activities in meaningful authentic contexts. Computers offer rich opportunities of letting young children experiment with real world artefacts, such as pictures and photos, to explore i.e. story structures. Furthermore, smooth technical solutions are needed to ensure that teachers' time is spent on the pupils, not on the technology. In the future, all schools need to adjust to the demands of the information society and providing computers. Instrumental practices transferred onto computers may, however, preserve the mechanical effects of such approaches whatever tools for learning that are employed, unless the issue of teacher knowledge is highlighted (Peacock & Beard, 1997). We find significant practical implications for principals and schools that invest in technology, and hope for far-reaching effects without investments and initiatives to in-service training of the teachers, not promoting "quick fixes"-methods, but aimed at deeper knowledge of literacy learning. The results of our studies indicate that the teacher's knowledge and conception of literacy is fundamental for the development of the classroom practice. The teacher's conceptions of literacy and learning set the aims for learning and form how different literacy events are carried out. New technology in no way will provide knowledge about literacy learning or compensate for teachers' poor craftsmanship. It is also up to the teacher to adapt the literacy practice to the children in the class. Explicit teaching and scaffolding provide children with less favourable home conditions with the knowledge and skills needed for academic success (Damber, 2009). Irrespective of the tools used for learning, the teacher needs to observe the different resources different children need to develop literacy (Freebody & Luke, 2003). Schön's (1983) idea of how teachers develop their professional skills according to the children's and the society's needs in an ever-changing practice emanates in the idea of the reflective practitioner. In our complex, multi-literate and inter-cultural world, the ability of reflection is the heart of the matter for all educators, if "quick fixes" are to be replaced by genuine learning approaches.

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